

By the Council of the ROYAL SOCIETY
of London for Improving of
Natural Knowledge.

Ordered, That the Book written by John Evelyn Esq;
Fellow of this Society, Entituled
SILVA; Or a Discourse of *Forest-Trees*, and the
Propagation of *Timber* in His Majesties Dominions : To
which is annexed *POMONA* ; Or an *Appendix* con-
cerning *Fruit-Trees* in relation to *Cider*, the Making and
several ways of Ordering it , be Printed by John Mar-
tyn and James Allestry, Printers to the said Society.

BROUNCKER, P. R. S.

By the Council of the ROYAL SOCIETY of London for Improving of Natural Knowledge.

Ordered, That the Book written by John Evelyn Esq; Fellow of this Society, Entituled *SYLVA*; Or a Discourse of *Forest-Trees*, and the Propagation of *Timber* in His Majesties Dominions : To which is annexed *POMONA*; Or an Appendix concerning *Fruit-Trees* in relation to *Cider*, the Making and several ways of Ordering it, be Printed by John Martyn and James Allestry, Printers to the said Society.

BROUNCKER, P. R. S.

SYLVA, Fff. 46.

Or A DISCOURSE OF
FOREST-TREES,

AND THE
Propagation of Timber in His
MAJESTIES Dominions.

As it was Deliver'd in the *ROYAL SOCIETY* the xvth of *October*,
CICLXII. upon occasion of certain *Quaries* propounded to that *Illustri-*
ous Assembly, by the *Honourable* the *Principal Officers*, and *Commissioners* of the *Navy*.

To which is annexed

POMONA; Or, An *Appendix* concerning *Fruit-Trees* in relation to *CIDER*;
The *Making*, and severall wayes of *Ordering* it;

Published by expresse Order of the *ROYAL SOCIETY*.

ALSO

KALENDARIVM HORTENSE; Or, the *Gard'ners Almanac*; Directing what he is to do
Monthly throughout the Year.

All which severall *Treatises* are in this *SECOND EDITION* much *Inlarged* and *Improved*

BY

JOHN EVELYN *Esq*; Fellow of the *ROYAL SOCIETY*.

— Tibi res antiqua laudis & artis
Ingredior, tantos ausus recludere fontes. — Virg.



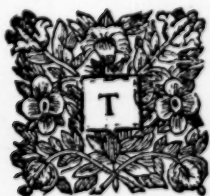
LONDON,
Printed for Jo. Martyn, and Ja. Allestry, Printers to the Royal Society. MDCLXX.

20...615



TO THE
K I N G.

S I R,



His Second Edition of SYLVA, after more than a Thousand Copies had been Bought up, and dispers'd of the First Impression, in much lesse time than two Years space (which Book-sellers assure us is a very extraordinary thing in Volumes of this bulk) comes now again to pay its Homage to your Serene Majesty, to whose Auspices alone it owes the favourable Acceptance which it has received in the World. But it is not That alone, which it presumes to tell your Majesty, but to acquaint You, that it has been the sole Occasion of furnishing your almost exhausted Dominions, with more (I dare say) than two Millions of Timber-Trees; besides infinite Others, which
a have

The EPISTLE

have been Propagated within the three Nations, at the Instigation, and by the Direction of this Work ; and that the Author of it is able (if need require) to make it out, by a competent Volume of Letters, and acknowledgments, which are come to his hands from several Persons of the most eminent Quality ; many of them Illustrious, and divers of them unknown to him, in justification of what he asserts, which he the rather preserves with the more care ; because they are Testimonials from so many honourable Persons, of the Benefit they have receiv'd from the Endeavours of the Royal Society, which, now adayes, passes through so many Cenſures ; but, she has yet your Majesty for her Founder and Patron, and is therefore the less concern'd ; since no man of worth can likely speak ill of an Assembly, which your Majesty has thought fit to dignifie, by so signal a Relation to it.

It is now about five years past, that your Majesty was pleas'd to declare your favourable Acceptance of a Treatise of Architecture which I then presented to you, with many gracious expressions, and that it was a most useful Piece. Sir, That Encouragement (together with the success both of the Book it self, and of the first Edition of this) has animated me to make a second Oblation to you of these Improvements : Nor was it certainly, without some Provident Conduct, that we have been thus solicitous to begin as it were, with Materials for Building, and Directions
to

D E D I C A T O R Y.

to Builders ; if due Reflections be made on that deplorable Calamity, the Conflagration of your Imperial City ; which neverthelesse by the Blessing of GOD, and your Majesties gracious Influence, we despair not of seeing Rise again, a New, and much more Glorious P H O E N I X.

This **TRIBUTE**, *I now once more lay at the Feet of our ROYAL FOUNDER : May your Majesty be pleas'd, to be Invok'd by that no Inglorious TITLE in the profoundest Submissions of*

Gracious Sir,

Says Court
Aug. 24 1669.

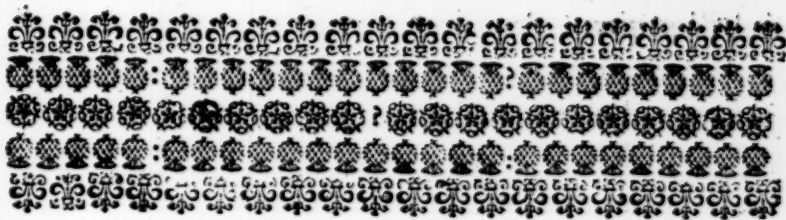
Your Majesties

Ever Loyal, most obedient,

and Faithful Subject,

and Servant,

J. EVELYN.



TO THE
R E A D E R.



FTER what the *Frontispiece* and *Porch* of this *Wooden Edifice* presents you, I shall need no farther to repeat the *Occasion* of this following *Discourse*; I am onely to acquaint you, That as it was delivered to the *Royal Society* by an unworthy *Member* thereof, in Obedience to their *Commands*; by the *same* it is now *Re-publish'd* without any farther *Prospect*: And the *Reader* is to know, That if these dry *sticks* afford him any *Sap*, it is one of the *least* and *meanest* of those *Pieces* which are every day produc'd by that *Illustrious Assembly*, and which enrich their *Collections*, as so many *Monuments* of their accurate *Experiments*, and Publick endeavours, in order to the production of *real* and useful *Theories*, the Propagation and Improvement of *Natural Science*, and the honour of their *Institution*. If to *this* there be any thing subjoyned *here*, which may a while bespeak the *Patience* of the *Reader*, it is onely for the encouragement of an *Industry*, and worthy *Labour*, too much in our *dayes* *neglected*, as haply reputed a *Consideration* of too sordid and vulgar a nature for *Noble Persons*, and *Gentlemen* to busie themselves withal, and who
b oftner



To the Reader.

oftner find wayes to *Fell down*, and Destroy their *Trees* and *Plantations*, than either to *repair* or *improve* them.

But we are not without hopes of taking off these *Prejudices*, and of reconciling them to a *Subject* and an *Industry* which has been *consecrated* (as I may say) by as good, and as great Persons, as any the World has produced: and whose Names we find mingl'd amongst *Kings*, and *Philosophers*, grave *Senators*, and *Patriots* of their Countrey: For such were of old *Solomon*, *Cyrus*, and *Numa*, *Licinius* surnamed *Stolo*, *Cato*, and *Cincinnatus*; the *Piso's*, *Fabii*, *Cicero*, the *Plinies*, and thousands more whom I might enumerate, that disdained not to cultivate these *Rusticities* even with their own hands, and to esteem it a great *Accession*, to dignifie their *Persons*, and adorn their *purple* with these *Rural Characters* of their affections to *Planting*, and love of this part of *Agriculture*, which has transmitted to us their venerable *Names* through so many *Ages* and *Vicissitudes* of the World.

See Petrarch
de Remed. u-
triusque fortu-
nae L. 1. Dial.
57.

That famous *Answer* alone which the *Persian Monarch* gave to *Lyfander*, will sufficiently justifie that which I have said; besides what we might add, out of the *Writings* and *Examples* of the rest: But since these may suffice, after due reproofs of the late impolitique *Wast*, and universal *Sloth* amongst us; we would now turn our *Indignation* into *Prayers*, and addresse our selves to our better natur'd *Countrymen*; that such *Woods* as do yet remain intire, might be carefully *Preserved*, and such as are *Destroy'd*, sedulously *repaired*: It is what all Persons who are *Owners* of *Land* may contribute to, and with infinite *delight*, as well as *profit*, who are touch'd with that laudable *Ambition* of imitating their *Illustrious Ancestors*, and of worthily serving their *Generation*. To these my earnest and humble *Advice* should be, That at their very first coming to their *Estates*, and as soon as they get *Children*, they would seriously think of *this Work* of *Propagation* also:

For,

To the Reader.

For, I observe there is no part of *Husbandry*, which men commonly more *Fail in, neglect*, and have cause to repent of, than that they did not begin *Planting betimes*, without which, they can expect neither *Fruit, Ornament*, or *Delight* from their *Labours* : Men seldom Plant *Trees* till they begin to be *Wise*, that is, till they grow *Old*, and find by *Experience* the *Prudence* and *Necessity* of it.

My next *Advice* is, that they do not easily commit themselves to the *Dictates* of their ignorant *Hinds* and *Servants*, who are (generally speaking) more fit to Learn than to Instruct. *Male agitur cum Domino quem Villicus docet*, was an Observation of old *Cato's*; and 'twas *Ischomachus* who told *Socrates* (discourfing one day upon a like subject) *That it was far easier to Make than to Find a good Husband-man* : I have often prov'd it so in *Gardeners*; and I believe it will hold in most of our *Country Employments* : We are to exact *Labour*, not *Conduct* and *Reason*, from the greatest part of them; and the business of *Planting* is an *Art* or *Science* (for so *Varro* has solemnly defin'd it) and that exceedingly wide of Truth, which (it seems) many in his time accounted of it; *facillimam esse, nec ullius acuminis Rusticationem*, an easie and insipid Study. It was the simple *Culture* onely, with so much difficulty retri'd from the late confusion of an intestine and bloody *War*, like *Ours*, and now put in *Reputation* again, which made the noble *Poet* write

Vide & Curtium, l. 7. Sec.

De R. R.

How hard it was
Low Subjects with illustrious words to grace.

Quam sit, & angustis hunc addere rebus honorem.
Verbis ea vincere magnum
Georg. 3.

Seeing, as the *Orator* does himself expresse it, *Nil est homine libero dignius*; there is nothing more becoming and worthy of a *Gentleman*. It was indeed a plain man (a *Potter* by *Trade*) but let no body despise him because a *Potter* (*Agathocles*, and a *King* was of that *Craft*) who

In agris erant tunc Senatores.
Cic. de Senect.

Polissy, le
Moyen de De-
venir Rich.

To the Reader.

in my Opinion has given us the true reason why *Husbandry*, and particularly *Planting*, is no more improv'd in this Age of ours : especially, where Persons are *Lords* and Owners of much *Land*. The truth is, sayes he, when men have acquired any considerable *Fortune* by their good *Husbandry*, and experience (forgetting that the greatest *Patriarchs*, *Princes*, their *Sons* and *Daughters*, belong'd to the *Plough*, and the *Flock*) they account it a *shame* to breed up their *Children* in the same *Calling* in which they themselves were educated, but presently design them for *Gentlemen* : They must forsooth, have a *Coat of Arms*, and live upon their *Estates*; So as by that time his Beard grows, he begins to be asham'd of his *Father*, and would be ready to defie him, that should upon any occasion mind him of his *honest Extraction* : And if it chance that the good-man have other *Children* to provide for; *This* must be the Darling, be bred at *School*, and the *University*, whilst the rest must to *Plow* with the *Father*, &c. This is the *Cause*, says my *Authour*, that our *Lands* are so ill *Cultivated*. Every body will subsist upon their own *Revenue*, and take their *Pleasure*, whilst they Resign their *Estates* to be manag'd by the most *Ignorant*, (which are the *Children* whom they leave at home, or the *Hinds* to whom they commit them.) When as in truth, and in reason, the more *Learning* the better *Philosophers*, and the greater *Abilities* they possesse, the more, and the better are they *qualified*, to *Cultivate*, and improve their *Estates* : Methinks this is well and rationally argued.

And now you have in part what I had to produce in extenuation of this my *Adventure*; that *Animated* with a *Command*, and Assisted by divers *Worthy Persons* (whose *Names* I am prone to *celebrate* with all just *Respects*) I have presumed to cast in my *Symbol*; and which, with the rest that are to follow, may (I hope) be in some degree serviceable to *him* (who e're the happy *Person* be) which shall oblige

To the Reader.

oblige the *World* with that compleat *Système* of *Agriculture*, which as yet seems a *desiderate*, and wanting to its perfection. It is (I assure you) what is one of the Principal *Designs* of the *ROYAL SOCIETY*, not in this *Particular* only, but through all the *Liberal* and more useful *Arts*; and for which (in the estimation of all equal *Judges*) it will merit the greatest of *Encouragements*; that so, at last, what the Learned *Columella* has wittily reproach'd, and complain'd of, as a defect in that *Age* of *his*, concerning *Agriculture* in general, and is applicable *here*, may attain its desired *Remedy* and *Consummation* in *This* of *Ours*.

Sola enim Res Rustica, quæ sine dubitatione proxima, & quasi consanguinea Sapientiæ est, tam discentibus eget, quam magistris: Adhuc in Scholis Rhetorum, & Geometrarum, Musicorumque, Vel quod magis mirandum est, contemptissimorum vitiorum officinas, gulosius condiendi cibos, & luxuriosius fercula struendi, capitumque & capillorum concinnatores non solum esse audiui, sed & ipse vidi; Agricolationis neque Doctores qui se profiterentur, neque Discipulos cognovi. But this I leave for our *Gallants* to Interpret, and should now apply my self to the *Directive* Part, which I am all this while bespeaking; if after what I have said in the several *Paragraphs* of the ensuing *Discourse* upon the *Argument* of *Wood*, (and which in this *Second* Edition coming *Abroad* with innumerable *Improvements*, to at the least, a *full-half* Augmented, and that with such *Advantages*; as I am not afraid, to pronounce it almost altogether a *New-Work*, so furnish'd, as I hope shall neither reproach the *Author*, or repent the *Reader*) it might not seem superfluous to have *promised* any thing *here* for the *Encouragement* of so becoming an *Industry*. There are divers *Learned*, and judicious *Men* who have *preceded* Me in this *Argument*; as many, at least, as have undertaken to Write and Compile vast *Herbals*, and *Theaters* of *Plants*; of which we have some of our own *Country-men*, who have (I dare boldly

Praefat. ad P. Sylvium; which I earnestly recommend to the serious perusal of our *Gentry*. Et mihi ad sapientis vitam proximè videtur accedere. Cic. de Senectute.

To the Reader.

affirm it) surpass'd *any*, if not *all* the *Forriners* that are extant: In *These* it is you meet with the *Description* of the several *Plants*, by *Discourses*, *Figures*, *Names*, *Places of Growth*, time of *Flourishing*, and their *Medicinal Virtues*; which may supply any *deficiency* of mine as to those *Particulars*; if the forbearing that *Repetition*, should by any be imputed for a *defect*, though it were indeed none of my *designe*: I say, these things are long since performed to our hands: But there is none of these (that I at least know of, and are come to my perusal) who have taken any considerable pains how to *Direct*, and *Encourage* us in the *Culture of Forest-Trees* (the grand *defect* of this *Nation*): besides some small sprinklings to be met withal in *Gervas Markham*, *Old Tusser*, and the *Country-Farm* long since Translated out of *French*; and by no means suitable to our clime and *Country*: Neither have *any* of these proceeded after my *Method*, and so particularly, in *Raising*, *Planting*, *Dressing* and *Governing*, &c. or so sedulously made it their business, to *specifie* the *Mechanical Uses* of the several *kinds*, as I have done, which was hitherto a great *desiderate*: and in which the *Reader* will likewise find some things altogether *New* and *Instructive*; and both *Directions* and *Encouragements* for the Propagation of some *Forain* Curiosities of *Ornament* and *Use*, which were hitherto neglected. If I have upon occasion presum'd to say any thing concerning their *Medicinal* properties, it has been *Modestly* and *Frugally*, and with chief, if not onely respect to the poor *Wood-man*, whom none I presume will envy, that living far from the *Physitian*, he should in case of *Neces-*

* *Nō Sylva quidem, horridiorque natura facies Medicinis carent, Sacra illa parente rerum omnium, nusquam non remedia disponente homini, ut Medicina, fieret etiam solitudo ipsa, &c. Hinc nata Medicina, &c. Hæc sola natura placuerat esse remedia parata vulgò, inventu facilis, ac sine impendio, ex quibus vivimus, &c. Plin. L. 24. c. 1.*

sity, consult the reverend *Druid*, his ** Okes*, and his *Elme*, *Birch* or *Elder*, for a short *Breath*, a *Green Wound*, or a sore *Leg*; Casualties incident to this hard *Labour*. These are the chief *Particulars* of this

ensuing *Work*, and what it pretends hitherto of *Singular*,
in

To the Reader.

in which let me be permitted to say, There is sufficient for *Instruction*, and more than is extant in any *Collection* whatsoever (*absit verbo invidia*) in this way, and upon this *Subject*; abstracting things *Practicable*, of solid *use*, and *material*, from the *Ostentation* and impertinences of divers *Writers*; who receiving all that came to hand on *trust*, to swell their monstrous *Volumes*, have hitherto impos'd upon the credulous *World*, without *conscience* or *honesty*. I will not exasperate the *Adorers* of our ancient and late *Naturalists*, by repeating of what our *Verulam* has justly pronounc'd concerning their *Rhapsodies* (because I likewise honour their painful *Endeavours*, and am oblig'd to them for much of that I know,) nor will I (with some) reproach *Pliny*, *Porta*, *Cardan*, *Mizaldus*, *Curcius*, and many others of great *Names* (whose *Writings* I have diligently consulted) for the *Knowledge* they have imparted to me on this *Occasion*; but I must deplore the time which is (for the most part) so miserably lost in pursuit of their *Speculations*, where they treat upon this *Argument*: But the *World* is now advis'd, and (blessed be *God*) infinitely redeem'd from that base and servile submission of our noblest *Faculties* to their blind *Traditions*. This, you will be apt to say, is a haughty *Period*; but whiles I affirm it of the *Past*, it *justifies*, and does *honour* to the *Present* Industry of our *Age*, and of which there cannot be a greater and more emulous *Instance*, than the *Passion* of His *Majesty* to encourage His *Subjects*, and of the *Royal Society*, His *Majesties* *Foundation*, who receive and promote His *Diates*, in all that is laudable and truly *emolumental* of this *Nature*.

It is not therefore that I here presume to instruct *Him* in the management of that great and august *Enterprise* of resolving to *Plant* and repair His ample *Forests*, and other *Magazines* of *Timber*, for the benefit of His *Royal Navy*, and the glory of His *Kingdoms*; but to present to His

To the Reader.

Sacred Person, and to the *World*, what *Advices* I have received from *others*, observed *myself*, and most *Industriously Collected* from a studious propensity to serve as one of the least *Intelligences* in the ampler *Orb* of our *Illustrious Society*, and in a *Work* so Important and Necessary.

J. E.

BOOKS Publish'd by the *Author* of
this *Discourse*.

1. *The French Gard'ner*, II. Edition: $\frac{\circ}{11}$.
2. *Fumi-fugium*, or a *Prophetic Invektive* against the *Smoke* of *London*: $\frac{\circ}{4}$.
3. *Sylva*, or a *Discourse* of *Forest-Trees*, &c. the II. Edition, very much *Improv'd*, Fol.
4. *Kalendarium Hortense*, both in Fol. and Octavo, the III. Edition, much *Augmented*.
5. *Sculptura*, or the *History* of *Chalcography* and *Engraving* in *Copper*, the *Original* and *Progreſſe* of that *Art*, &c. Octavo.
6. *The Parallel of Architecture*, being an *Account* of *Ten* famous *Architects*, with a *Discourse* of the *Tearms*, and a *Treatiſe* of *Statues*: Fol.
7. *The Idea* of the *Perfection* of *Painting*: Octavo.

T H E

Amico charissimo *Johanni Evelyno* Armigero,
ë Societate Regali Londini. J. Beale, S. P. D.
In Sylvam.

FAre age quid causæ est quod tu Sylvestria pangis,
Inter Sylvanos, capripedesque Deos?
Inter Hamadryadas letus, Dryadasque pudicas,
Cum tua Cyrrhæis sit Chelys apta modis!
Scilicet hoc cecinit numerosus Horatius olim,
Scriptorum Sylvam quod Chorus Omnis amat.
Est locus ille Sacer Musis, & Apolline dignus,
Prima dedit Summo Templa Sacrandæ Jovi.
Hinc quoque nunc Pontem Pontus non respuit ingens,
Stringitur Oceanus, corripiturque Salum.
Hinc novus Hesperiiis emerfit mundus in oris,
Effuditque auri flumina larga probi.
Hinc exundavit distento Copia cornu,
Qualem & Amalthææ non habuere sinus.
Sylva tibi curæ est, grata & Pomona refundit
Auriferum, roseum, purpureumque nemus.
Illa famemque sitimque abigens expirat odores,
Quales nec Medus, nec tibi mittit Arabs.
Ambrosiam præbent modo coacta Cydonia, Tantum
Comprime, Nectareo poma liquore fluunt.
Progredere, O Sæcli Cultor memorande futuri,
Felix Horticolam sic imitere Deum.

Gen. 1. 6. 2.

d

Nobilissimo

Nobilissimo Viro Johanni Evelyno Regalis
Soc. Socio dignissimo.

Ausus laudato qui quondam reddere versu,
Æternum & tentare melos, conamine magno
Lucretij nomenque suum donaverat ævo :
Ille leves atomos audaci pangere musa
Aggreditur, variis & semina cæca figuris,
Naturæque vias, non quæ Schola garrula jactat,
Non quæ rixanti fert barbaræ turba Lyceo ;
Ingentes animi sensus, & pondera rerum,
Grandior expressit Genius, nec scripta minora
Ev'linum decuisse solent.

Libro de colori-
bus.

Tuque per obscuros (victor Boylæ) recessus,
Naturæ meditaris opus, qua luce colores
Percipimus, quali magnus ferit organa motu
Cartesius, quali volitant primordia plexu
Ex atomis Gassende, tuis ; simulachraque rerum
Diffugiunt subito vastum per inane meatu ;
Mutato varios mentitur lana colores
Lumine ; dum tales ardens habet ipsa figuræ
Purpura, Sidoniæque aliæ tinxere veneno :
Materiam assiduo variatam, ut Protea, motu
Concipis, hinc formæ patuit nascentis origo,
Hinc hominum species & vasti machina cæli :
Ipse creare Deus, solusque ostendere mundum
Boylæus potuit ; sed nunc favet æmula virtus
(Magne Eveline) tibi & generosos excitat ignes ;
Pergite Scipiadæ duo, qui vel mille Marones
Vincitis, & meriti longo lassatis honore.

De origine for-
matum.

De Wotton in
agro Surrensi.

Tu vero dilecte nimis ! qui stemmate ab alto
Patricios deducis avos, cerasque parentum
Wottonicæ de stirpe domus ; virtutibus æquas
Nunc generis monumenta tui, post tædia Ponti

*Innumerasque errore vias, quid Sequana fallax,
 Quæ Rhenus malefidus agit, quæ Tiberis, & Ister,
 Nota tibi : triplici quid perfida Roma corona
 Gessit, & Adriaca Venetus deliberat arce,
 Qualiaque Odryfias vexarunt prælia lunas:
 Europæ Mundique artes Eveline, reducis,
 Dum Phœbo comes ire paras, animamque capacem
 Vidit uterque polus; nec Grajum cana vetustas
 Te latuit, veterum nunc præca numismata regum
 Eruis, & Latias per mystica templa ruinas;
 Æstimat ille Forum & vasti fundamina Circi,
 Cumque ruinoso Capitolia præca Theatro,
 Et Dominos colles altæque palatia Romæ,
 Regales notat inde domos, ut mole superba
 Surgat apex, molles quæ tecta imitantur Ionas
 Qualia Romulea, Gothica quæ marmora dextra
 Quicquid Tuscus habet, mira panduntur ab arte;
 O famæ patriæque sacer !. modo diruta chartis
 Vivet Roma tuis; te vindice, læta Corinthus
 Stabit adhuc magno nequicquam inuisa Metello.*

*Consule librum
 Autoris de Ar-
 chiepiscopo.*

*Nunc quoque Ruris opes dulcesque ante omnia curas
 Pandis ovans, tristes maneat quæ cura Decembres,
 Pleiades hæc Hyadesque jubent, ut læta Bootes
 Semina mandet humi, ardenti quæ Sirius agro
 Cæpit ut æstiva segetes torrere favilla
 Quid Maij vermantis opus, cum florea ferta
 Invitant Dominas ruris, cum vere tepenti
 Ridet ager renovatque suos Narcissus amores,
 Haud aliter victrix divinam Æneida vates
 Lusit opus; simul & gracili modulatus avena,
 Fata decent majora tuos Eveline, triumphos,
 Æternum renovatur honos, te nulla vetustas
 Obruet, atque tua servanda volumina cedro
 Durent, & meritam cingat tibi laurea frontem
 Qui vitam Sylvis donasti & Floribus ævum.*

R. Bohun.

ΕΙΣ ΤΗΝ ΤΟΥ ΠΑΤΡΟΣ ΔΕΝΔΡΟΛΟΓΙΑΝ.

Υ Μνήσω φρονίμιο πατὴρ μελέεσιν ἐπαίνους,
 Ὑμνήσω ἐπέεσιν ἀρισεύοντα γεωργῶν.
 Οὐρανίην ἑταῆς ἀρετὴν δρυὸς αὐτὸς ἔγραψεν,
 Καὶ ποταπῶν γενεὴν δένδρων καὶ δάσκιον ὕλην.
 Ἀθανάτων κύδιον ἔη νεφεληγερέτα Ζεὺς,
 Ἔσχεν δὴ δένδρῳ φίλας προπύδασιν ἔελδωρ,
 Φύλλοις τ' ἀμβροτοῖς θαλεράς δρυὸς ἐξεφάνωτο·
 Ἀγλικάων ὅς ἀρίστος ἔη θεοεικέλιος ἀνὴρ,
 Ἴσορὴν δένδρων τέλεσεν φρέσι κυθαλίμοισι,
 Ἴλογενὴς, κηπυρὸς, ὑπὸ ἑσπερίῳ, ὅς μ' ἐγὼ ὄναια
 Ἀνδράσιν ἑσπομένοισι καὶ γαίην περλυβότειραν,
 Νηυσὶ τε ποντοπόροισι βαρυγυδίοιο θαλάσσης.

Jo. Evelyn, Jun.



A
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SYLVA:
OR, A
DISCOURSE
OF
Forest-Trees,

AND
The Propagation of *Timber* in His MAJESTIES
Dominions, &c.

*Tuque ades, inceptumque una decurre laborem,
O decus, ô famæ merito pars maxima nostra,
CAROLIDE, pelagoque volans da vela petenti;
Da facilem cursum, atque audacibus annue cæptis:
Ignarosque viæ mecum miseratus agrestes
Ingredere, & votis jam nunc assuesce vocari.*

The Introduction.

I.  Ince there is nothing which seems more fatally *Introduction,*
to threaten a *Weakening*, if not a *Dissolution* of
the strength of this famous and flourishing *Nation*,
then the sensible and notorious decay of
her *Wooden walls*, when either through *time*,
negligence, or other *accident*, the present *Navy*
shall be worn out and impair'd; it has been a
very worthy and seasonable Advertisement in the Honourable the
principal *Officers* and *Commissioners*, what they have lately suggest-
ed to this *Illustrious Society*, for the timely prevention and redress
of this intollerable defect. For it has not been the late increase
of *Shipping* alone, the multiplication of *Glass-works*, *Iron-Furna-*
ces, and the like, from whence this impolitick diminution of our
Timber has proceeded; but from the disproportionate spreading
C of

of *Tillage*, caused through that prodigious havock made by such as lately professing themselves against *Root* and *Branch* (either to be re-imburs'd of their *Holy* purchases, or for some other sordid respect) were tempted, not only to *fell* and *cut* down, but utterly to *grub up*, *demolish*, and *raze*, as it were, all those many goodly *Woods*, and *Forests*, which our more prudent *Ancestors* left standing, for the Ornament, and service of their *Country*. And this *devastation* is now become so *Epidemical*, that unless some favourable *expedient* offer it self, and a way be seriously, and speedily resolv'd upon, for the future repair of this intollerable *defect*, one of the most glorious, and considerable *Bulwarks* of this *Nation*, will, within a short time, be totally wanting to it.

2. To attend now a *spontaneous* supply of these decay'd *Materials* (which is the vulgar, and natural way) would cost (besides the *Inclosure*) some entire *Ages* repose of the *Plow*: Therefore, the most expeditious, and obvious *Method*, would (doubtless) be by one of these two ways, *Sowing*, or *Planting*. But, first, it will be requisite to agree upon the *Species*; as what *Trees* are likely to be of greatest *Use*, and the fittest to be cultivated; and then, to consider of the *Manner* how it may best be effected. Truly, the waste, and *destruction* of our *Woods*, has been so universal, that I conceive nothing less than an universal *Plantation* of all the sorts of *Trees* will supply, and well encounter the defect; and therefore, I shall here adventure to speak something in general of them all; though I chiefly insist upon the propagation of *such* only as seem to be the most wanting, and serviceable.

3. And first by *Trees* here, I consider principally for the *Genus generalissimum*, such *Lignous* and woody *Plants*, as are hard of substance, *procere* of stature; that are *thick* and *solid*, and stiffly adhere to the *Ground* on which they stand: These we shall divide into the *Greater* and more *Ceduous*, *Fruticant* and *Shrubby*; *Feras* and wild; or more *Civiliz'd* and domestique; and such as are *Sative* and *Hortensial* subalternate to the other; But of which I give only a touch, distributing the rest into these two *Classes*, the *Dry*, and the *Aquatic*; both of them applicable to the same civil uses of *Building*, *Ustensils*, *Ornament*, and *Fuel*; for to dip into their *Medicinal* virtues is none of my *Province*, though I sometimes glance at them with due *submission*, and in few *Instances*.

4. Among the *dry*, I esteem the more principal, and solid, to be the *Oak*, *Elme*, *Beech*, *Asp*, *Chest-nut*, *Wall-nut*, &c. The less principal, the *Service*, *Maple*, *Lime-tree*, *Horn-beam*, *Quick-beam*, *Birch*, *Hazel*, &c. together with all their *sub-alternate*, and several kinds.

— Which of how many sorts they are, We can't at present here stand to declare. *Sed neque quam multa species, nec nomina qua sint, Est numerus, Geor. 2.*

5. Of the *Aquatical*, I reckon the *Poplars*, *Asp*, *Alder*, *Willow*, *Sallow*, *Oser*, &c. Then I shall add a word or two, for the encouragement of the planting of *Fruit-trees*, together with some less vulgar, but no less *useful* *Trees*, which, as yet are not *endenizon'd* amongst us, or (at least) not much taken notice of: And in pursuance here-
of,

of, I shall observe this *order*: First, to shew how they are to be *Raised*, and then to be *Cultivated*; By *raising*, I understand the *Seed* and the *Soil*; by *Culture* the *Planting*, *Fencing*, *Watering*, *Dressing*, *Pruning* and *Cutting*; of all which briefly.

6. And first for their *Raising*, some there are,

Spring of themselves unforc't by human care,

Nullis hominum cogentibus, ipsa
Sponte sua veniunt

Specifying according to the various disposition of the *Air* and *Soil*;

Some from their *Seeds* arise.

Partem autem posito surgunt de semine.

As the *Oak*, *Chest-nut*, *Ash*, &c.

Some to thick Groves from their own *Roots* do spring, Pullulas ab radice alibi densissima Sylva.

As the *Elme*, *Alder*, &c. and there are others,

Grow without Root

Nul radicis egent

as *Willows*, and all the *Vimineous* kinds, which are raised of *Setts* only.

These ways first Nature gave,

Hos natura modos primum dedit

For thus we see there are more ways to the *Wood* than one; and she has furnish'd us with variety of expedients.

7. And here we might fall into a deep *Philosophical* Research, whether the *Earth* it self in some place thereof or other, even without *Seed*, *Branch* or *Root*, &c. would produce every kind of *Vegetable*, as it manifestly does, divers sorts of *Grasse* and *Plants*? (*viz.*) the *Tre-sole* or *Clover* in succulent land; In dry ground *May* and *Rag-weeds*; In the very moist, *Argentina*, *Flaggs*, &c. And the very barren *Ferne*, *Broome*, and *Heath*, &c. So *Virgil* notes sterile places for the *Pitch-tree*; we our wett and *Uliginous* for *Birch*, *Alder*, &c. The more lofty, poor and perflatile for *Eugh*, *Guiniper*, *Box*, and the like; and we read in the *Natural Histories* of divers *Countries*, that the *Cedar*, *Palmetos* *Queen-Pines*, *Ebony*, *Nutmeg*, *Cinnamon*, &c. For *Trees*; the *Tulip*, *Hyacinth*, *Crocus*, &c. For *Flowers*, are sometimes, and in some regions *Aborigines*, descended immediately from the *Genius* of the *Soyls*, *Climate*, *Sun*, *Shade*, *Air*, *Winds*, *Water*, *Niterous-Salts*, *Rocks*, *Bankes*, *Shores*, and (as the *Negros-Heads* in the *Barbados*) even without *Seed*, or any perceptible rudiment. But with all this we are not satisfied without supposing some previous *seminal* disposition lurking, and dispers'd in every part of the *Earth*, in what *Moleculæ* or subtile *contextures* we shall not enquire, but though happily not at first so perfect as the maturer *Seeds* of their after peculiar *Plants*; yet such as are fit for the *Sun* and *Influences* to operate on, 'til they have prepar'd, discuss'd, and excited their *Seminal* and *Prolifigue* vertue to exert it self and awake out of sleep, in which they lay as in their *causes*; And free themselves from those impediments which hindred their *Specification* and *Nativity*: This Conception the learned *Gassendus* would illustrate by the latent fire in *Flints*, which never betrays it self 'til

'til it be forced out by *Collision*; but which yet methinks, does not so fully enlighten this *Hypothesis*, which we only hint for Method and Introduction onely: For the design of this *Discourse* is not to perswade *Men* to sit still, and let *Nature* work alone, but to ayd and assist *her* as much as they are able from *Seeds* and *Plants* already perfected, and qualified for more speedy *Propagation*. Most Ingenious, in the mean time is what some upon an accurate and narrow guesse, have not feared to pronounce; namely, that all planting by *Seed*, was but a kind of *Inoculation*; and propagation by *Cjons* and *Sprouts*, but a *Subterranean Grafting*: And upon this account I am the more willing to assent, that in *Removing* of wild *Trees*, taken out of incumber'd places, (so it be perform'd with all due circumstances) there may happen considerable *Improvements*; since, as there is something in *Super grafting*, or the repetition of *Grafting* for the enlargement, and melioration of *Fruit*; so there may be also in a carefull *Removal*; especially the *Tree* being of a kind apt to dilate its *Roots*, and taken whilst those *Roots* may be safely, and intirely transferr'd; and likewise, because it is presum'd that most *Trees* propagated by *Seeds*, emitt a principal *Root*, very deep into the *Earth*, which frequently extracting but a courser *Nutrimment* (though it may happily yield a close, and firmer *Timber*) yet is not so apt to Shoot and spread, as what are by *Removal* deprived of that *Root*, and by being more impregnate with the *Sun*, *Dews* and heavenly *Influences* neer the surface, inabled to produce larger, more delicate and better tasted *Fruit*; supposing *Nutts*, *Mast*, or *Berries*, for we would not go out of our *Forest* for instances. And yet even in these descents of the *Top-Root*, it sometimes penetrating to a *Veine* of some rich *Marle* or other *Mould*, the extraordinary flourishing and expedition of growth, will soon give notice of it. But to make some *Trial* of this, 'twere no difficult matter, when one plants a *Nursery* or *Grove*, to experiment what the *Earth*, as far as the *Roots* are like to reach, will advance and discover to us.

8. In the mean time, it has been stiffly controverted by some, whether were better to raise *Trees* for *Timber*, and the like uses, from their *Seeds* and first *Rudiments*; or to *Transplant* such as we find have either rais'd themselves from their *Seeds*, or spring from the *Mother roots*. Now, that to produce them immediately of the *Seed* is the better way, these *Reasons* may seem to evince,

First. because they take soonest. *Secondly*, because they make the straightest, and most uniform shoot. *Thirdly*, because they will neither require *staking*, nor *watering* (which are two very considerable *Articles*) and *lastly*, for that all *transplanting* (though it much improve *fruit trees*) unless they are taken up the first Year, or two, is a considerable impediment to the growth of *Forest-trees*. And, though it be true, that divers of those which are found in *Woods*, especially *Oaklings*, young *Beeches*, *Ash*, and some others, spring from the self-sown *mast* and *keys*; yet, being for the most part dropp'd, and disseminated amongst the half rotten sticks, musty leaves, and perplexities of the *mother-roots*, they grow scrag-

gy; and being over-dripp'd become squalid and mossie,

Which checks their growth, and makes their bodies pine. *Crescentique adimunt satius, utrunque ferunt.*
Geo. 2.

Nor can their roots expand, and spread themselves as they would do if they were *sown*, or had been *planted* in a more open, free, and ingenuous *Soil*. And that this is so, I do affirm upon *Experience*, that an *Acorn* sown by hand in a *Nursery*, or ground where it may be free from these encumbrances, shall in two or three Years out-strip a *Plant* of twice that age, which has either been self-sown in the *Woods*, or removed; unless it fortune, by some favourable accident, to have been scattered into a more natural, penetrable, and better qualified place: But this disproportion is yet infinitely more remarkable in the *Pine*, and the *Wall-nut tree*, where the *Nut* set into the ground does usually overtake a *Tree* of ten years growth which was planted at the same instant; and this is a *Secret* so generally mis-represented by most of those who have treated of these sort of *Trees*, that I could not suffer it to pass over without a particular *remark*; so as the noble *Poet* (with pardon for receding from so venerable *Authority*) might be mistaken, when he delivers this observation as *universal*, to the prejudice of *Sowing*, and raising *Woods* from their Rudiments:

Trees which from scattered Seeds to spring are made
Come slowly on; for our *Grand-childrens* shade.

*Nam quæ seminibus iactis se sustulit arbor
Tarda venit; seris factura nepotibus umbram.*
Geor. 2.

And indeed I know divers are of this opinion; and possibly in some luckier *Soils*, and where extraordinary care is had in *Transplanting*, and removing cumbrances, &c. There may be reason for it; But I affirm it *is in modum*, and for the most part, and find I have the suffrage of another no inelegant *Poet*, if not in a full assent to my *Affertion*, yet in the choyce of my procedure for their perfection.

— Though *Suckers* which the *Stock* repaire,
Will with thick Branches crowd the empty Aire,
Or the *Ground-Oak* transplanted, boughs may shoot;
Yet no such *Groves* do's with my fancy suit
As what from *Acorns* set on even rows
In open fields at their due distance grows.
What though your Ground long time must fallow ly,
And *Seedling-Oaks* yield but a slow supply?
No walks else can be for like beauty prais'd
For, certain 'tis, that *Plants* from *Acorns* rais'd,
As to the *Center* deeper *fibers* spread,
So to the *Zenith* more advance their head:
Be it that *Plants* for natural moisture pine,
And as expos'd at Change of *Soils* decline;
Or that the *Acorn* with its native mould
Do's thrive, and spread, and firme alliance hold.

— *Quamvis ipsa de Stirpe parentis
Pullulet, & tenuis tollat se quercus in auras,
Aut mutata solo, ramis exulcet opacis;
Forma tamen nemoris non sit mihi gratior ulla,
Quam quod per campos, posito de semine, crevit
Et quamquam sit agro prælongum tempus inertis
Durcendum, ac tarda surgant de semine quercus:
His tamen, his longe veniunt felicius umbra.
Nam certum est de glande satas radicibus imis
Alius in terram per se descendere plantas:
Majoresque adeo in cælum profundere ramos.
Sed quod dediscant mutatam semina matrem,
Dignæ remque ferant alieno ex ubere prolem:
Sive quod ipsa tibi cognata inolescere terra
Glans primo melius paulatim assuevit ab ortu.*
Rapinus Hort. l. 2.

CHAP. I.

*Of the Soile, and of Seed.**Soile.*

1. **H**ERE, for *Methods* sake, something it were expedient to premise concerning the *Soile*; and indeed I do acknowledge to have observ'd so vast a *difference* in the Improvement of *Woods*, by that of the *Ground*, that it is at no hand to be neglected: But this being more than Transitorily touch'd in each *Chapter* of the ensuing *Discourse*, I shall not need to assign it any apart, when I have affirm'd in General, that most *Timber-Trees* grow and prosper well in any tollerable *Land* which will produce *Corn* or *Rye*, and which is not in excessse *Stony*; in which neverthelesse there are some *Trees* delight; or altogether *Clay*, which few, or none do naturally affect; And yet the *Oak* is seen to prosper in it, for its toughnesse preferr'd before any other by many *Workmen*, though of all *Soyls* the *Cow-pasture* do certainly exceed, be it for what purpose soever of planting *Wood*. Rather therefore we should take notice how many great *Witts* and *ingenious* Persons, who have leasure and faculty are in pain for *Improvements* of their *Heaths* and barren *Hills*, cold and starving places, which causes them to be neglected and despair'd of; whilst they flatter their hopes and vain expectations with fructifying liquors, *Chymical Menstrues* and such vast conceptions; in the mean time that one may shew them as *Heathy* and *Hope-les* grounds, and barren *Hills* as any in *England*, that do now bear, or lately have born *Woods*, *Groves* and *Copses* which yield the *Owners* more *wealth*, than the richest and most opulent *Wheat-Lands*: And if it be objected that 'tis so long a day before these *Plantations* can afford that gain; The *Brabant* Nurseries, and divers home-plantations of *Industrious Persons* are sufficient to convince the gain-sayer. And when by this *Husbandry* a few *Acorns* shall have peopl'd the *Neighboring Regions* with young *Stocks* and *Trees*; the residue will become *Groves* and *Copses* of infinite delight and satisfaction to the *Planters*. Besides, we daily see what *Course* *Lands* will bear these *Stocks* (suppose them *Oaks*, *Wall-nutts*, *Chest-nutts*, *Pines*, *Firr*, *Ash*, *Wild-Pears*, *Crabbs*, &c.) and some of them, as for instance the *Peare* and the *Firr* or *Pine*, strike their *Roots* through the roughest and most impenetrable *Rocks* and clefts of *Stone* it self; and others require not any *rich* or *pingued*, but very moderate *Soile*; especially, if committed to it in *Seeds*, which allyes them to their *Mother* and *Nurse* without renitency or regret: And then considering what assistances a little *Care* in easing and stirring of the ground about them for a few years does afford them: What cannot a strong

strong *Plow*, a *Winter* mellowing, and *summer* heats, incorporated with the pregnant *Turfe*, or a slight assistance of *Lime* performe even in the most unnatural and obstinate *Soile*? And in such places where anciently *Woods* have grown, but are now unkind to them, the fault is to be reformed by this Care; and chiefly, by a *Sedulous extirpation* of the old remainders of *Roots*, and latent *Stumps*, which by their *mustiness*, and other pernicious qualities, sowre the ground, and poyson the *Conception*; And herewith let me put in this note, that even the *Soile* it self does frequently discover and point best to the particular *Species*, though some are for all places alike: but I shall say no more of these *particulars* at this time, because, the rest is sprinkl'd over this whole *Work* in their due places; Wherefore we hasten to the following *Title*, namely, the choyce and ordering of the *Seeds*.

2. Chuse your *Seed* of that which is perfectly *mature*, *ponderous* *Seeds*. and *sound*; commonly that which is easily shaken from the *boughs*, or gathered about *November*, immediately upon its spontaneous fall, or taken from the tops and summities of the fairest and soundest *Trees*, is best, and does (for the most part) direct to the proper season of *interring*, &c. According to *Institution*. For,

Nature her self who all created first,
Invented sowing, and the wild Plants nurs't:
When Mast and Berries from the Trees did drop,
Succeeded under by a numerous Crop.

Nam specimen sationis, & institutionis origo
Ipsa fuit rerum primum nativa creatrix:
Arboribus quoniam bacca, glandesque caduca
Tempestiva dabant pullorum examina subter, &c.

Lucret. l. 5.

Yet this is to be consider'd, that if the *place* you sow in be too cold for an *Autumnal* semination, your *Acorns*, *Mast*, and other *Seeds* may be prepared for the *Vernal* by being barrel'd, or potted up in moist *Sand* or *Earth stratum* S. S. during the *Winter*; at the expiration whereof you will find them *sprouted*; and being committed to the *Earth*, with a tender hand, as apt to *take* as if they had been sown with the most early, may with great advantage: by this means, too, they have escaped the *Vermine* (which are prodigious devourers of *Winter* sowing) and will not be much concern'd with the increasing heat of the *Season*, as such as being crude, and *unfermented* are newly sown in the beginning of the *Spring*; especially in hot and loose *Grounds*; being already in so fair a progress by this artificial preparation; and which (if the provision to be made be very great) may be thus manag'd. Chuse a fit piece of *Ground*, and with boards (if it have not that *position* of it self) design it three *foot* high; lay the first *foot* in fine *Earth*, another of *Seeds*, *Acorns*, *Mast*, *Keys*, *Nuts*, *Haws*, *Holly-berries*, &c. Promiscuously, or separate, with (now, and then) a little *Mould* sprinkled amongst them: The third *foot* wholly *Earth*: Of these preparatory *Magazines* make as many, and as much larger ones as will serve your turn, continuing it from time to time as your *store* is brought in. The same for ruder handlings, may you also do by burying your *Seeds* in dry *Sand*, or pulveriz'd *Earth*, *Barrelling* them (as I said) in *Tubs*, or laid in heaps in some deep *Cellar* where the rigour of the *Winter* may least prejudice them; and I have fill'd old *Hampers*,

pers, *Bee-hives*, and *Boxes* with them, and found the like advantage, which is to have them ready for your *Seminary*, as before hath been shew'd, and exceedingly prevent the season. There be also who affirm, that the carefull cracking and opening of *Stones* which include the *Kernels*, as soon as ripe, precipitate *Growth* and gain a *years* advance.

3. But to pursue this to some farther Advantage; as to what concerns the election of your *Seed*, It is to be consider'd, that there is vast difference, (what if I should affirm more than an *hundred years*) in *Trees* even of the same *growth* and *Bed*, which I judge to proceed from the variety and quality of the *Seed*: This, for instance, is evidently seen in the heart, *procerity* and stature of *Timber*; and therefore chuse not your *Seeds* alwaies from the most *Fruitful-trees*, which are commonly the most *Aged*, and decayed; but from such as are found most *solid* and *fair*: Nor, for this reason, covet the largest *Acorns*, &c. (but as *Husband men* do their *Wheat*) the most *weighty*, *clean* and *bright*: This Observation we deduce from *Fruit-trees*, which we seldom find to bear so kindly, and plentifully, from a *sound* stock, *smooth* Rind, and *firm* Wood, as from a *rough*, *lax*, and *untoward* Tree, which is rather prone to spend it self in *Fruit*, (the ultimate effort, and final endeavour of its most delicate *Sap*,) than in *solid* and *close substance* to encrease the *Timber*. And this shall suffice, though some haply might here recommend to us a more accurate *Microscopical* examen, to interpret their most secret *Schematisms*, which were an over nicity for these great *Plantations*.

4. As concerning the *medicating*, and *insuccation* of *Seeds*, or enforcing the Earth by rich and generous *Composts*, &c. for *Trees* of these kinds, I am no great favourer of it; not only, because the charge would much discourage the *Work*; but for that we find it unnecessary, and for most of our *Forest-trees*, noxious; since even where the ground is too fertile, they thrive not so well; and if a *Mould* be not proper for one sort it may be fit for another: Yet I would not (by this) hinder any from the trial, what advance such *Experiments* will produce: In the mean time, for the simple *Imbibition* of some *Seeds* and *Kernels*, when they prove extraordinary dry, and, as the Season may fall out, it might not be amiss to *macerate* them in *Milk*, or *Water* only, a little *impregnated* with *Cow-dung*, &c. during the space of twenty four hours, to give them a *spirit* to sprout, and *cheat* the sooner; especially, if you have been retarded in your *sowing* without our former preparation.

5. Being thus provided with *Seeds* of all kinds, I would advise to raise *Woods* by sowing them *apart*, in several places destin'd for their growth, where the *Mould* being prepar'd (as I shall shew hereafter) and so qualified (if election be made) as best to suit with the nature of the *Species*, they may be sown *promiscuously*, which is the most natural and *Rural*; or in streight and even lines, for *Hedg-rows*, *Avenues*, and *Walks*, which is the more *Ornamental*: But, because some may chuse rather to draw them out of *Nurseries*; that

that the *Culture* is not much different, nor the hinderance considerable (provided they be early, and carefully Removed) I will finish what I have to say concerning these *Trees* in the *Seminary*, and shew how they are *there* to be *Raised*, *Transplanted*, and *Govern'd* till they can shift for themselves.

CHAP. II.

Of the *Seminary*.

1. *Qui Vineam, vel Arbustum constituere volet, Seminaria prius* *Seminary.* *facere debet*, was the precept of *Columella*, l. 3. c. 5. speaking of *Vineyards* and *Fruit-trees*: and, doubtlesse, we cannot pursue a better Course for the Propagation of *Timber-trees*: For though it seem but a trivial design that one should make a *Nursery* of *Foresters*; yet it is not to be imagin'd, without the experience of it, what prodigious *Numbers* a very small spot of Ground well Cultivated, and destin'd for this purpose, would be able to furnish towards the sending forth of yearly *Colonies* into all the naked quarters of a *Lordship*, or *Demeafnes*; Being with a pleasant *Industry* liberally distributed amongst the *Tenants*, and dispos'd of about the *Hedge-rows*, and other *Waste*, and uncultivated places, for *Timber*, *Shelter*, *Fuel*, and *Ornament*, to an incredible Advantage. This being a cheap, and laudable Work, of so much pleasure in the execution, and so certain a profit in the event; to be but once well done (for, as I affirm'd, a very small *Nursery* will in a few years people a vast extent of Ground) hath made me sometimes in admiration at the universal negligence.

2. Having therefore made choice of some fit place of Ground, well Fenced, respecting the *South-east*, rather than the full *South*, and well protected from the *North* and *West*;

He that for wood his Field would sow,
Must clear it of the *Shrubs* that grow;
Cut Brambles up, and the Ferne mow.

*Qui serere ingenium volet agrum,
Libera prius arva fruticibus;
Falce rubos, filicemque reserat.*

Boeth. l. 2. Met.

This done, let it be Broken up the *Winter* before you sow, to mellow it; especially if it be a *Clay*, and then the furrow would be made deeper; or so, at least; as you would prepare it for *Wheat*: Or you may Trench it with the *Spade*, by which means it will the easier be cleansed of whatsoever may obstruct the putting forth, and insinuating of the tender *Roots*: Then having given it a second stirring, immediately before you sow, cast, and dispose it into *Rills*, or small narrow Trenches of four, or five inches deep, and in even lines, at two foot interval, for the more commodious Runcation, Hawing, and dressing the *Trees*: Into these Furrows (for a *Conseminea Sylva*)

Sylva) throw your *Oak*, *Beech*, *Ash*, *Nuts*, all the *Glandiferous* *Seeds*, *Maſt*, and *Key-bearing* kinds, ſo as they lie not too thick, and then cover them very well with a *Rake*, or fine-tooth'd *Harrow*, as they do for *Peaſe*: Or, to be more accurate, you may ſet them as they do *Beans* (eſpecially, the *Nuts* and *Acorns*) and that every *Species* by themſelves, for the *Roboraria*, *Glandaria*, *Ulmaria*, &c. which is the better way: This is to be done at the latter end of *October*, for the *Autumnal* ſowing; and in the lighter ground about *February* for the *Vernal*.

Then ſee your hopeful *Grove* with *Acorns* ſown,
But e're your *Seed* into the *Field* be thrown
With crooked *Plough* firſt let the luſty *Swain*
Break-up, and ſtubborn *Clodds* with *Harrow* plain.
Then when the *Stemm* appears, to make it bare
And lighten the hard *Earth* with *Hough*, prepare.
Hough in the *Spring*: nor frequent *Culture* fail,
Leſt noxious *Weeds* ore the young *Wood* prevail:
To barren ground with toyle large meanour add,
Good-huſbandry will force a Ground that's bad.

Proinde nemus ſparſa cures de glande parandum:
Sed tamen ante tuo mandes quam ſemina campo;
Ipſe tibi dura robuſtus vomere ſeffor
Omne ſolum ſubigat late, explanetque ſubaſum.
Cumque novus fiſſo primum de germine ramus
Findit humum, ruruſus ferro verſanda bicorni
Conſta vere novo tellus, cultuque frequenti
Exercenda, herba circum ne forte nocentes
Preveniant, germenque ipſum radicibus urant.
Nec cultu campum cunctantem urgere frequenti,
Et ſaturare ſimo pudeat, ſi forte reſiſtat.
Cultura: nam triſtis humus ſuperanda colendo eſt.

Rapin. l. 2.

Note that 6 *Buſhells* of *Acorns* will ſow or plant an *Aker*, at one foot's diſtance.

3. Your *Plants* beginning now to peep ſhould be earthen'd up, and comforted a little; eſpecially, after breaking of the greater *Froſts*, and when the ſwelling mould is apt to ſpue them forth; but when they are about an *inch* above ground you may in a *moiſt* ſeaſon, draw them up where they are too *thick*, and ſet them immediately in other *lines*, or *Beds* prepar'd for them; or you may plant them in double *ſoffes*, where they may abide for good and all, and to remain till they are of a competent ſtature to be *Transplanted*; where they ſhould be ſet at ſuch *diſtances* as their ſeveral *kinds* require; but if you draw them only for the thinning of your *Seminary*, prick them into ſome empty *Beds* (or a *Plantarium* purpoſely deſign'd) at one foot *interval*, leaving the reſt at two or three.

4. When your *Seedlings* have ſtood thus till *June*, beſtow a ſlight digging upon them, and ſcatter a little *mungy*, half rotten *Litter*, *Fearn*, *Bean-hame*, or old *Leaves* among them, to preſerve the *Roots* from ſcorching, and to entertain the moiſture; and then in *March* following (by which time it will be quite conſum'd and very mellow) you ſhall chop it all into the *earth*, and mingle it together: Continue this *proceſs* for two or three years ſucceſſively; For till then, the ſubſtance of the *Kernell* will hardly be ſpent in the plant, which is of maine import; but then (and that the ſtature of your young *Impes* invite) you may plant them forth, carefully taking up their *Roots*, and cutting the *Stem* within an *inch* of the ground (if the *kind*, of which hereafter, ſuffer the *knife*) ſet them where they are to continue: If thus you reduce them to the diſtance of forty foot; the *Intervals* may be planted with *Aſh*, which may be fell'd either for *Poles*, or *Timber* without the leaſt prejudice of the *Oak*, ſome repeat the cutting we ſpake of the ſecond *Tear*, and after *March* (the

(the *Moon* decreasing) re-cut them at half a foot from the surface; and then meddle with them no more: but this (if the process be not more severe than needs) must be done with a very sharp *Instrument*, and with care, least you violate, and unsettle the *Root*; which is likewise to be practis'd upon all those which you did not *Transplant*, unless you find them very thriving *Trees*; and then it shall suffice to *prune* off the *Branches*, and spare the *Tops*; for this does not only greatly establish your *Plants* by diverting the *Sap* to the *Roots*; but likewise frees them from the injury and concussions of the *Winds*, and makes them to produce handsom, streight *shoots*, infinitely preferable to such as are abandon'd to *Nature*, and *Accident*, without this discipline: By this means the *Oak* will become excellent *Timber*, shooting into streight and single *Stems*;: The *Chest-nut*, *Ash*, &c. multiply into *Poles*, which you may reduce to *standards* at pleasure: To this I add, that as oft as you make your annual *Transplanting*, out of the *Nursery*, by drawing forth the choicest *Stocks*, the remainder will be improved by a due stirring and turning of the *mould* about their *Roots*.

5. *Theophrastus* in his third Book *de Causis* c. 7. gives us great caution in planting to preserve the *Roots*, and especially the *Earth*, adhering to the smallest *Fibers*, which should by no means be shaken off, as most of our *Gardeners* do to trim and quicken them as they pretend, which is to cut them shorter, &c. not at all considering, that those tender *Hairs* are the very *mouths* and *Vehicles* which suck in the nutriment, and transfuse into all the parts of the *Tree*, and that these once perishing, the thicker and larger *Roots*, hard and less spongie, signifie little but to establish the *Stem*; as I have frequently experimented in *Orange-Trees*, whose *Fibers* are so very obnoxious to rot, if they take in the least excess of wet: And therefore *Cato* advises us to take care that we bind the *mould* about them, or transfer the *Roots* in *Baskets*, to preserve it from forsaking them; For this *Earth* being already applied and fitted to the *overtures* and *mouths* of the *Fibers*, it will require sometime to bring them in appetite again to a new *mould*, by which to repair their loss, furnish their stock, and proceed in their wonted *Oeconomy* without manifest danger and interruption: Nor less ought our care to be in the making and dressing of the *pits* and *fosses* into which we design our *Transplantation*, which should be prepar'd and left some time open to macerating *Rains*, *Frosts* and *Sun*, that may resolve the compacted *Salt*, render the *Earth* friable, mix and qualifie it for aliment, and to be more easily drawn in and digested by the *Roots* and analogous *Stomack* of the *Trees*: This to some degree may be artificially done, by burning of *straw* in the newly opened *Pits*, and drenching the *mould* with *Water*; especially in over dry seasons, and by meliorating barren-ground with sweet, and comminuted *letations*.

6. The Author of the *Natural History*, *Pliny*, tells us it was a vulgar *Tradition*, in his time, that no *Tree*, should be Removed under two years old, or above three: *Cato* would have none *Trans-*
planted

planted less than five fingers in *diameter*; But I have shew'd why we are not to attend so long for such as we raise of *Seedlings*: In the interim, if these directions appear too busie, or *operose*, or that the *Plantation* you intend be very ample, a more compendious *Method* will be the confused sowing of *Acorns*, &c. in *Furrows*, two foot asunder, covered at three fingers depth, and so for three years cleansed, and the first *Winter* cover'd with *searn*, without any farther culture, unless you *Transplant* them; but, as I shew'd before, in *Nurseries* they would be cut an *inch* from the *Ground*, and then let stand till *March* the second year, when it shall be sufficient to *disbranch* them to one only shoot, whether you suffer them to *stand*, or remove them elsewhere. But to make an *Essay* what *Seed* is most agreeable to the *Soil*, you may by the *thriving* of a promiscuous *Semination* make a judgement of,

What each *Soil* bears, and what it does refuse.

Quid quaque ferat regio, & quid quaque recuset.

Transplanting those which you find least agreeing with the *place*; or else, by *Copsing* the *starvings* in the places where they are new sown, cause them sometimes to overtake even their untouch'd *contemporaries*.

7. But here some may inquire what *distances* I would generally assign to *Transplanted Trees*? To this somewhat is said in the ensuing *Periods*, and as occasion offers; though the promiscuous rising of them in *Forest-Work*, wild, and natural is to us I acknowledge more pleasing, than all the studied accuracy in ranging of them; unless it be, where they conduct and lead us to *Avenues*, and are planted for *Vistas* (as the *Italians* term it) in which case, the proportion of the *Breadth* and *Length* of the *Walks*, &c. should govern, as well as the Nature of the *Tree*, with this only note; That such *Trees* as are rather apt to spread, than mount, as the *Oak*, *Beech*, *Wall-nutt*, &c. be dispos'd at wider intervals, than the other, and such as grow best in *Consort*, as the *Elm*, *Ash*, *Lime-tree*, *Sycamore*, *Fir*, *Pine*, &c. Regard is likewise to be had to the quality of the *Soil*, for this work: V. G. If *Trees* that affect cold and moist grounds, be planted in hot and dry places, then set them at closer Order; but *Trees* which love scorching and dry Grounds at farther distance: The like rule may also guide in situations expos'd to impetuous *Winds* and other accidents which may serve for general *Rules* in this piece of *Tatties*.

8. To leave nothing omitted which may contribute to the stability of our *Transplanted Trees*, something is to be premis'd concerning their *staking*, and securing from external injuries, especially from *Winds* and *Cattel*, against both which, such as are planted in *Copses*, and for ample *Woods*, are sufficiently defended by the *Mounds* and their closer order; especially, if they rise of *Seed*: But where they are expos'd in single rows, as in *Walks* and *Avenues*, the most effectual course is to empale them with three good quarter *stakes* of competent length set in triangle and made fast to one another by short pieces above and beneath; in which a few *Brambles* being

being stuck, secure it abundantly without that choking or fretting, to which *Trees* are obnoxious that are only single *Staked* and *Bush-*
ed as the vulgar manner is; Nor is the *charge* of this so considerable, as the great *advantage*, accounting for the frequent reparations which the other will require. Where *Cattel* do not come, I find a good piece of *Rope*, tyed fast about the neck of *Trees* upon a *miss* of *straw* to preserve it from galing, and the other end tightly strein'd to a *hook* or *peg* in the ground (as the *Shrouds* in *Ships* are fastned to the *Masts*) sufficiently stablishes my *Trees* against the *Western* blasts without more trouble; for the *Winds* of other *quarters* seldom infest us. But these *Cords* had need be well *pitch't* to preserve them from wett, and so they will last many Years: I cannot in the mean time conceal what a noble Person has assur'd me, that in his goodly *Plantations* of *Trees* in *Scotland*, where they are continually expos'd to much greater, and more impetuous *Winds* than we are usually acquainted with; he never *stakes* any of his *Trees*; but upon all disasters of this kind, causes only his *Servants* to *redress*, and set them up again as oft as they happen to be overthrown; which he has affirm'd to me, thrives better with them, than with those which he has *staked*; and that at last they strike root so fast, as nothing but the *Axe* is able to prostrate them; and there is good reason for it in my opinion, whilst these concussions of the *Roots*, loosning the *mould*, not only make room for their more easie insinuations, but likewise opens, and prepares it to receive, and impart the better nourishment: It is in another place I suggest that Transplanted *Pines* and *Firrs*, for want of their penetrating *Tap roots*, are hardly consistent against these *Gusts* after they are grown high; especially where they are set close, and in *Tufts*, which betraies them to the greater disadvantage; And therefore such *Trees* do best in *Walks*, and at competent *distances*, where they escape tolerably well: Such therefore as we design for *Woods* of them, should be sow'd, and never remov'd; but of this hereafter. I now proceed to particulars.

CHAP. III.

Of the Oak.

Oak.

I. **R**obur, the Oak, I have sometimes consider'd it very seriously, what should move *Pliny* to make a whole Chapter of one only Line, which is less then the Argument alone of most of the rest in his huge *Volumn* : but the weightiness of the Matter does worthily excuse him, who is not wont to spare his Words, or his Reader. *Glandiferi maxime generis omnes, quibus honos apud Romanos perpetuus.* "Mast-bearing-trees were principally those which the Romans held in chiefest repute, lib.6.cap.3. And in the following where he treats of Chaplets, and the dignity of the Civic Coronet, it might be compos'd of the Leaves or Branches of any Oak, provided it were a bearing Tree, and had Acorns upon it. It is for the esteem which these wise, and glorious people had of this Tree above all others, that I will first begin with the Oak.

2. The Oak is of four kinds; two of which are most common with us; (for we shall say little of the *Cerris*, goodly to look on, but for little else) the *Quercus urbana*, which grows more up-right, and being clean, and lighter is fittest for Timber: And the Robur or *Quercus Sylvestris*, (taking Robur for the general name, at least, as contradistinct from the rest) which is of an hard, black grain, bearing a smaller Acorn, and affecting to spread in branches, and to put forth his Roots more above ground; and therefore in the planting, to be allow'd a greater distance; viz. from twenty five, to forty foot; (nay sometimes as many yards) whereas the other shooting up more erect will be contented with fifteen: This kind is farther to be distinguish'd by his fullness of leaves, which tarnish, and becoming yellow at the fall, do commonly clothe it all the Winter, the Roots growing very deep and stragling. The Author of *Britannia Baconica* speaks of an Oak, in *Lanbardon Park* in *Cornwall*, which bears constantly leaves speckl'd with White; and of another call'd the Painted Oak, which I only mention here, that the variety may be compar'd by some ingenious person thereabouts, as well as the truth of the fatal *pre-admonition* of Oaks bearing strange leaves.

3. It is in the mean time the propagation of this large spreading Oak, which is especially recommended for the excellency of the Timber, and that his Majesties Forests were well and plentifully stor'd with them; because they require room, and space to amplify and expand themselves, and would therefore be planted at more remote distances, and free from all encumbrances: And this upon consideration how slowly a full-grown Oak mounts upwards, and how speedily they spread, and dilate themselves to all quarters, by dressing

dressing and due culture ; so as above *forty years* advance is to be gain'd by this only Industry : And, if thus his *Majesties* Forests, and *Chases* were stor'd ; viz. with this *spreading Tree* at handsom *Intervals*, by which *Grazing* might be improv'd for the feeding of *Deer* and *Cattel* under them, (for such was the old *Salus*) benignly visited with the *gleams* of the *Sun*, and adorn'd with the distant *Landskips* appearing through the glades, and frequent *Vallies*.

betwixt
Whose rows the azure *Sky* is seen immix'd,
With *Hillocks*, *Vales*, and *Fields*, as now wee see
Distinguish'd in a sweet variety ;
Such places which wild *Apple-trees* throughout
Adorn, and happy *Shrubs* grow all about.

*Cervula distinguens inter plaga currere possit
Per tumulos, & convalles, camposque profusa :
Ut nunc esse vides vario distincta lepore
Omnia, qua pomis interstita dulcibus ornant
Arbutisque tenent felicibus obsita circum.*

Lucret. l. 5.

As the *Poet* describes his *Olive-groves*. Nothing could be more ravishing ; for so we might also sprinkle *Fruit-trees* amongst them (of which hereafter) for *Sider*, and many singular uses, and should find such goodly *Plantations* the boast of our *Rangers*, and *Forests* infinitely preferable to any thing we have yet beheld, *rude*, and *neglected* as they are : I say, when his *Majesty* shall proceed (as he hath *design'd*) to animate this laudable pride into fashion, *Forests* and *Woods* (as well as *Fields* and *Inclosures*) will present us with another face than now they do. And here I cannot but applaud the worthy Industry of old Sir *Harbottle Grimstone*, who (I am told) from a very small *Nursery* of *Acorns*, which he sow'd in the neglected corners of his ground, did draw forth such numbers of *Oaks* of competent growth ; as being planted about his *Fields* in even, and uniform rows, about one hundred foot from the *Hedges* ; bush'd, and well water'd till they had sufficiently fix'd themselves, did wonderfully improve both the beauty, and the value of his *Demeasnes*. But I proceed.

4. Both these *kinds* would be taken up very young, and *Transplanted* about *October* ; some yet for these hardy, and late springing *Trees*, defer it till the *Winter* be well over ; but the Earth had need be moist ; and though they will grow tolerably in moist grounds ; yet do they generally affect the *sound, black, deep and fast* mould, rather warm than over wet and cold, and a little *rising* ; for this produces the firmest *Timber* ; though my *L. Bacon* prefer that which grows in the *moister* grounds for *Ship timber*, as the most *tough*, and less subject to *rift* : but let us hear *Pliny*. This is a general Rule, *saith he* ; "What *Trees* soever they be which grow tolerably either "on *Hills*, or *Vallies*, arise to greater stature, and spread more amply "in the *lower ground* : But the *Timber* is far better, and of a finer "grain, which grows upon the *Mountains* ; excepting only *Apple*, "and *Pear trees*." And in the 39 cap. lib. 16. The *Timber* of those "Trees which grow in *moist* and *shady* places is not so good as "that which comes from a more expos'd situation, nor is it so close, "substantial and durable ; upon which he much prefers the *Timber* growing in *Tuscany*, before that towards the *Venetian* side ; and upper part of the *Gulph* : And that *Timber* so growing was in greatest esteem long before *Pliny*, we have the *spear* of *Agamemnon*

ἔχον ἀνεμοτραφεῖς ἕλχθ'. Ἰα λ': from a Tree so expos'd ; and *Dydimus* gives the reason. Τὰ δ' ἐν ἀνέμῳ (says he) πλέον γυμναζόμενα δύ-
 δεα. στερεά, &c. For that being continually *weather-beaten* they be-
 come hardier and tougher. The result of all is, that upon occasion
 of special *Timber*, there is a very great and considerable difference ;
 so as some *Oaken Timber* proves manifestly weaker, more spungie,
 and sooner decaying than other : The like may be affirm'd of *Ash*,
 and other kinds ; and generally speaking, the *close-grain'd* is the
 stoutest, and most permanent : But of this let the industrious con-
 sult that whole *tenth Chapter* in the *second Book* of *Vitruvius*, where
 he expressly treats of this Argument, *De Abiete supernate & inferna-
 te, cum Apennini descriptione* : Where we note concerning *Oak*,
 that it neither prospers in very *hot*, nor excessive *cold* Countries ;
 and therefore there is little good of it to be found in *Africa*, or
 indeed, the lower, and most southern parts of *Italy* (for the *Vene-
 tians* have excellent *Timber*) nor in *Denmark* or *Norway* compara-
 ble to ours ; it chiefly affecting a temperate *Climate*, and where
 they grow naturally in abundance, 'tis a promising marke of it ; If
 I were to make choice of the *place*, or the *Tree*, it should be such as
 grows in the best *Cow-pasture*, or, up-land *Meadow*, where the mould
 is rich and sweet (Suffolk affords an admirable instance) and in such
places you may also *Transplant* large *Trees* with extraordinary success ;
 And therefore it were not amiss to bore, and search the ground
 where you intend to plant or sow before you fall to work ; since
 Earth too *shallow* or *rockie* is not so proper for this *Timber* ; the
Roots fix not kindly, and though for a time they may seem to
flourish, yet they will dwindle.

5. But to discourage none, *Oaks* prosper exceedingly even in
 gravel, and moist *Clays*, which most other *Trees* abhor ; yea,
 even the coldest *Clay* grounds that will hardly graze : But these
Trees will frequently make *Stands*, as they encounter variety of
 footing ; and sometimes proceed again vigorously, as they either
 penetrate beyond, or out-grow their obstructions, and meet bet-
 ter Earth, ; which is of that consequence, that I dare boldly affirm,
 more than an *hundred* years advance is clearly gain'd by *Soil* and
Husbandry. I have yet read, that there grow *Oaks* (some of which
 have contain'd ten loads apiece) out of the very Walls of *Silcester*
 in *Hants*hire, which seem to strike root in the very *Stones* ; and e-
 ven in our renowned *Forest* of *Dean* it self, some goodly *Oaks* have
 been noted to grow upon *Ground*, which has been as it were a
Rock of antient *Cinders*, buried there many ages since. It is indeed
 observ'd, that *Oaks* which grow in rough *stony* grounds, and obsti-
 nate *clays*, are long before they come to any considerable stature ;
 for such places, and all sort of *Clay*, is held but a *step-mother* to *Trees* ;
 but in time they afford the most excellent *Timber*, having stood
 long, and got good *rooting* : The same may we affirm of the lightest
sands, which produces a smother-grain'd *Timber*, of all other the
 most useful for the *Joyner* ; but that which grows in *Gravell* is sub-
 ject to be *Frow* (as they term it) and brittle. What improvement the
 stir-

stirring of the ground about the roots of *Oaks* is to the *Trees* I have already hinted; and yet in *Copses* where they stand *warm*, and so thick'd with the *under wood*, as this culture cannot be practis'd, they prove in time to be goodly *Trees*. I have of late tried the *Grafting* of *Oaks*, but as yet with slender success; *Ruellius* indeed affirms it will take the *Pears* and other *Fruit*, and if we may credit the *Poet*,

The sturdy *Oak* do's Golden Apples bear.

And under *Elms* swine do the Mast devour.

Aurea dura
Mala ferant quercus.

Ecl. 3.
Glandemque suis frugere sub Ulmo.
Geor.

Which I conceive to be the more probable, for that the *Sap* of the *Oak* is of an unkind tincture to most *Trees*. But for this Improvement, I would rather advise *Inoculation*, as the ordinary *Elm* upon the *Witch-Hazel*, for those large *leaves* we shall anon mention, and which are so familiar in *France*,

6. That the Transplanting of young *Oaks* gains them *ten* years *Advance* some happy persons have affirmed: from this belief, if in a former *Impression* I have desir'd to be excus'd, and produc't my Reasons for it, I shall not persist against any sober mans *Experience*; and therefore leave this *Article* to their choice; since (as the *Butchers* phrase is) change of *Pasture* makes fat *Calves*; and so *Transplantations* of these hard wood-trees, when young, may possibly, by an happy hand, in fit season, and other circumstances of *Soil*, *Sun*, and *Room* for growth, be an improvement: But as for those who advise us to plant *Oaks* of too great a stature, they hardly make any considerable progress in an *Age*, and therefore I cannot encourage it unless the ground be extraordinarily qualified: Yet if any be desirous to make *trial* of it let their *Stems* be of the smoothest, and tenderest *Bark*; for that is ever an indication of *youth*, as well as the paucity of their *Circles*, which in disbranching, and cutting the head off, at *five* or *six* foot height (a thing, by the way, which the *French* usually spare when they *Transplant* this *Tree*) may (before you stir their *Roots*) serve for the more certain *Guide*; and then plant them immediately, with as much Earth as will adhere to them, in the place destin'd for their *station*; abating only the *tap roots*, which is that down-right, and stubby part of the *Roots* (which all *Trees* rais'd of *Seeds* do universally produce) and quickning some of the rest with a sharp *knife* (but sparing the *Fibrous*, which are the main *Suckers* and *Mouths* of all *Trees*) spread them in the *foss*, or *pit* which hath been prepar'd to receive them. I say in the *foss*, unless you will rather *trench* the whole *Field*, which is incomparably the best; and infinitely to be preferr'd before narrow *pits* and holes (as the manner is) in case you plant any number considerable, the Earth being hereby made *loose*, *easier* and *penetrable* for the *Roots*, about which you are to cast that *Mould* which (in opening of the *Trench*) you took from the *Surface*, and purposely laid apart; because it is sweet, mellow, and better *impregnated*: But in

in this *Work*, be circumspect never to *inter* your *Stem* deeper than you found it standing; for profound *buryings* very frequently destroys a *Tree*; though an *Errour* seldom observed: If therefore the *Roots* be sufficiently cover'd to keep the *Body* steady and erect, it is enough; and the not minding of this trifling *Circumstance* does very much deceive our ordinary *Wood-men*: For most *Roots* covet the *Air* (though that of the *Quercus urbana* least of any, for like the *Æsculus*

How much to heaven her trowing head ascends,
So much towards hell her piercing root extends.

Quod quantum vertice ad auras
(Æthereas, tantum radicem Tartara tendis)

Geo. 2.

And the perfection of *that* does almost as much concern the prosperity of a *Tree*, as of *Man* himself; since *Homo* is but *Arbor inversa*; which prompts me to this *curious*, but important *Advertisement*; That the *Position* be likewise sedulously observed.

7. For, the *Southern* parts being more *dilated*, and the *pores* expos'd (as evidently appears in their *Horizontal Sections*) by the constant *Excentricity* of their *Hyperbolical Circles*, being now on the *sudden*, and at such a season converted to the *North*, does *sterve*, and destroy more *Trees* (how carefull soever men have been in ordering the *Roots*, and preparing the *Ground*) than any other *Accident* whatsoever (neglect of *staking*, and *defending* from *Cattle* excepted) the importance whereof caused the best of *Poets*, and most experienc'd in this *Argument*, giving advice concerning this *Article*, to add.

The Card'nal poyns upon the Bark they signe,
And as before it stood, in the same line
Place to warm south, or the obverted pole;
Such force has custome, in each tender soule.

Quintiam Cæli regionem in cortice signant,
Ut quo quaque modo steteris, quâ pars calores
Austriacos tuleris, quâ terga obverteris axi;
Restituant: Adco in teneris consuescere multum est.

Geor. li. i.

Which *Monition*, though *Pliny*, and some *others* think good to neglect, or esteem *indifferent*, I can confirm from frequent losses of my own, and by particular *trials*; having sometimes *Transplanted* great trees at *Mid-summer* with successe (the *Earth* adhering to the *Roots*) and miscarried in others where this *Circumstance* only was omitted.

To observe therefore the *Coast*, and side of the stock (especially of *Fruit-trees*) is not such a trifle as by some pretended: For if the *Air* be as much the *Mother* or *Nurse*, as *Water* and *Earth*, (as more than probable it is) such blossoming Plants as court the motion of the *Meridian Sun*, do as 'twere evidently point out the advantage they receive by their *position* by the clearness, politure, and comparative splendor of the *South side*: And the frequent *mossiness* of most *Trees* on the opposite side, does sufficiently note the unkindness of that *Aspect*; and which is most evident in the *bark* of *Oaks* white and smooth; The *Trees* growing more kindly on the *South* side of an *Hill*, than those which are expos'd to the *North*, with an hard, dark, rougher, and more mossie *Integument*, as I can now demonstrate in a prodigious coat of it, investing some *Pyracanth*s which I have removed to a *Northern* dripping

ping shade. I have seen (writes a worthy Friend to me on this occasion) whole *Hedge-rows* of *Apples* and *Pears* that quite perished after that shelter was removed : The good *Husbands* expected the contrary , and that the *Fruit* should improve , as freed from the predations of the *Hedge* ; but use and custom made that shelter necessary ; and therefore (saith he) a *stock* for a time is the weaker, taken out of a *Thicket* , if it be not well protected from all sudden and fierce invasions either of crude *Air* or *Winds* : Nor let any be deterr'd, if being to remove many *Trees* , he shall esteem it too consumptive of time ; for with a *Brush* dipped in any white colour, or *Oaker* , a thousand may be marked as they stand, in a moment ; and that once done, the difficulty is over. I have been the larger upon these two *Remarks* , because I find them so *material*, and yet so much neglected.

8. There are other *Rules* concerning the *situation* of *Trees* ; the former *Author* commending the *North-east-wind* both for the flourishing of the *Tree* , and advantage of the *Timber* ; but to my observation in our *Climates* , where those sharp *winds* do rather *slanker* than blow fully opposite upon our *Plantations* , they thrive best ; and there are as well other *Circumstances* to be considered, as they respect *Rivers* and *Marshes* obnoxious to unwholsom and poysonous *Fogs* ; *Hills* , and *Seas* , which expose them to the weather ; and those *sylvisfragi venti* , our cruel , and tedious *Western-winds* ; all which I leave to Observation , because these *Accidents* do so universally govern, that it is not easie to determine farther than that the *Timber* is commonly better qualified which hath endur'd the colder *Aspects* without these prejudices : And hence it is, that *Seneca* observes *Wood* most expos'd to the *Winds* to be the most *strong* and *solid* , and that therefore *Chiron* made *Achilles's* *Spear* of a *Mountain-tree* ; and of those the best which grow thin, not much shelter'd from the *North*. Again, *Theophrastus* seems to have special regard to *places* ; exemplifying in many of *Greece* , which exceeded others for good *Timber* , as doubtlesse do our *Oaks* in the *Forest* of *Dean* all others of *England* : and much certainly there may reasonably be attributed to these advantages for the growth of *Timber* , and of almost all other *Trees* , as we daily see by their general improsperity where the ground is a *hot gravel* , and a *loose earth* : An *Oak* or *Elme* in such a place shall not in an *hundred years* overtake one of *fifty* planted in its *proper Soil* ; though next to this and (haply) before it, I prefer the good *Air* : But thus have they such vast *Junipers* in *Spain* ; and the *Asbes* in some parts of the *Levant* (as of old neer *Troy*) so excellent , as it was after mistaken for *Cedar* , so great was the difference ; as now the *Cantabrian* or *Spanish* exceeds any we have else where in *Europe*. And we shall sometimes in our own *Country* see *Woods* within a little of each other, and to all appearance, growing on the same *Soil* , that *Oaks* of twenty years growth, or forty, will in the same bulke of *Timber* , contain their double in *Heart* and *Timber* ; and that in one the *Heart* will not be so big as a mans *Arm* , when the
trunke

trunke exceeds a mans *body*: This ought therefore to be weighed in the first plantation of *Coppes*, and a good *Eye* may discern it in the first *Shoot*; the difference proceeding doubtlesse from the variety of the *Seed*, and therefore great care should be had of its goodness, and that it be gather'd from the best sort of *Trees*, as was formerly hinted, c.1.

9. *Veterem Arborem Transplantare* was say'd of a difficult enterprise; Yet before we take leave of this *Paragraph*, concerning the *Transplanting* of great *Trees*, and to shew what is possible to be effected in this kind, with cost, and industry; *Count Maurice* (the late *Governour* of *Brasil* for the *Hollanders*) planted a *Grove* neer his delicious *Paradise* of *Friburge*, containing six hundred *Coco-trees* of eighty years growth, and fifty foot high to the neereft bough: these he wafted upon *Floats*, and *Engines*, four long miles, and planted them so luckily, that they bare abundantly the very first year; as *Gasper Barlaus* hath related in his elegant *Description* of that *Princes* expedition: Nor hath this only succeeded in the *Indies* alone; *Monsieur de Fiat* (one of the *Marshals* of *France*) hath with huge *Oaks* done the like at *de Fiat*: shall I yet bring you neerer home? A great person in *Devon*, planted *Oaks* as big as twelve *Oxen* could draw, to supply some defect in an *Avenue* to one of his houses; as the Right Honourable the Lord *Fits-Harding*, late *Treasurer* of his *Majesties* household, assur'd me; who had himself likewise practis'd the *Removing* of great *Oaks* by a particular address extreamly ingenious, and worthy the communication.

10. Chuse a *Tree* as big as your *thigh*, remove the earth from about him; cut through all the *collateral* *Roots*, till with a competent strength you can enforce him down upon one side, so as to come with your *Ax* at the *Tap-root*; cut that off, redress your *Tree*, and so let it stand cover'd about with the *Mould* you loosen'd from it, till the next year, or longer if you think good; then take it up at a fit season; it will likely have drawn new tender *Roots* apt to take, and sufficient for the *Tree*, wheresoever you shall *Transplant* him: *Pliny* notes it as a common thing, to re-establish huge *Trees* which have been blown down, part of their *Roots* torn up, and the body prostrate; and, in particular, of a *Fir*, that when it was to be *Transplanted* had a *tap-root* which went no less than eight cubits perpendicular; and to these I could superadd, but I proceed. To facilitate the *Removal* of such monstrous *Trees*, for the *Adornment* of some particular place, or the rarity of the *Plant*, there is this expedient. A little before the hardest *Frosts* surprize you, make a square *Trench* about your *Tree*, at such distance from the *Stem* as you judge sufficient for the *Root*; dig this of competent depth, so as almost quite to undermine it; by placing *blocks*, and *quarters* of wood, to sustain the *Earth*; this done, cast in as much *Water* as may fill the *Trench*, or at least sufficiently wet it, unless the ground were very moist before. Thus let it stand, till some very hard *Frost* do bind it firmly to the *Roots*, and then convey it to the *pit* prepar'd for its new station; but in case the mould about it be so ponderous as not
to

to be remov'd by an ordinary force ; you may then raise it with a *Crane* or *Pully* hanging between a *Triangle*, which is made of three strong and tall *Limbs* united at the top, where a *Pully* is fastned, as the *Cables* are to be under the quarters which bear the earth about the *Roots* : For by this means you may weigh up, and place the whole weighty *Clod* upon a *Trundle* to be convey'd, and *Replanted* where you please, being let down prependiculary into the place by the help of the foresaid *Engine*. And by this *addresse* you may *Transplant* Trees of a wonderfull *stature*, without the least disorder ; and many times without *topping*, or diminution of the *head*, which is of great importance where this is practis'd to supply a *Defect*, or remove a *Curiosity*.

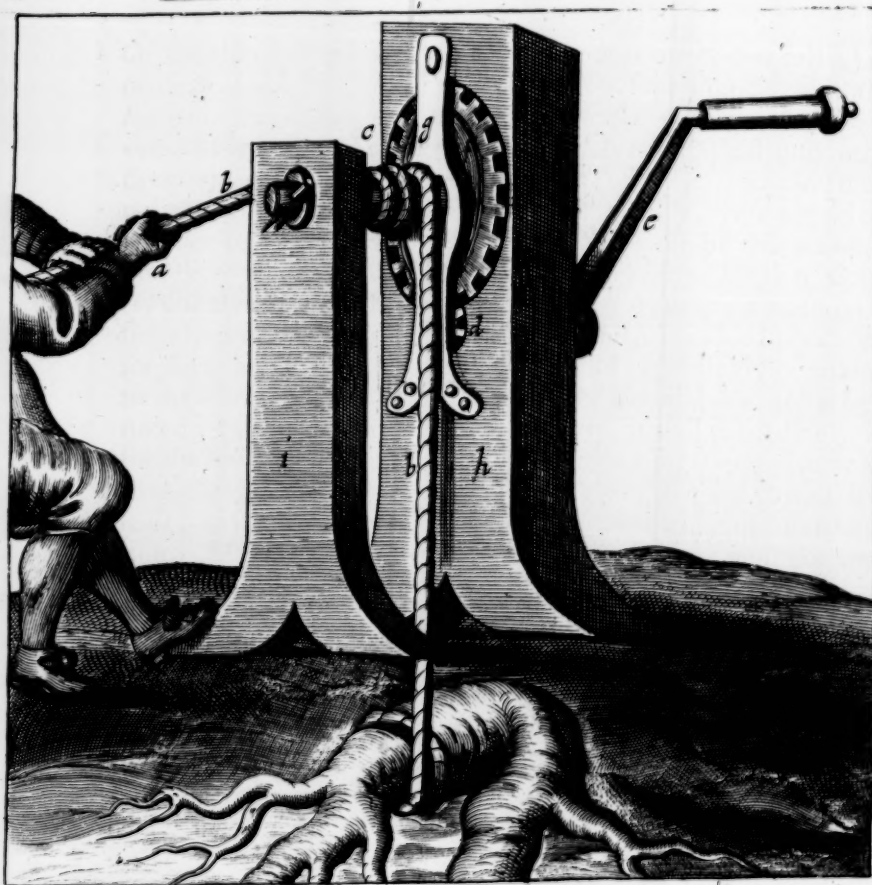
11. Some advise, that in planting of *Oaks*, &c. *four*, or *five*, be suffer'd to stand very neer to one another, and then to leave the most *prosperous*, when they find the rest to disturb his growth ; but I conceive it were better to plant them at such *distances*, as they may least incommode one another : For *Timber-trees*, I would have none neerer then *forty* foot where they stand *closest* ; especially of the spreading kind.

12. Lastly, Trees of ordinary stature *Transplanted* (being first well *water'd*) must be sufficiently staked, and *Buss'd* about with *thorns*, or with some thing better, to protect them from the concussions of the *Winds*, and from the casual *rubbing*, and poysonous brutting of *Cattle* and *Sheep*, the *oylinesse* of whose *Wooll* is also very noxious to them ; till being well *grown*, and *fixed* (which by *seven* years will be to some competent degree) they shall be able to withstand all accidental *invasions*, but the *Axe* ; for I am now come to their *Pruning* and *Cutting*, in which work the *Seasons* are of main importance.

13. Therefore, if you would propagate *Trees* for *Timber*, cut not off their *heads* at all, nor be too busie with lopping : but if you desire *Shade*, and *Fuel*, or bearing of *Mast* alone, lop off their tops, *sear*, and unthriving *Branches* only ; If you intend an out-right *selling*, expect till *November* ; for this *premature* cutting down of *Trees* before the *Sap* is perfectly at rest will be to your exceeding prejudice, by reason of the *Worm*, which will certainly breed in the *Timber* which is felled before that period : But in case you cut only for the *Chimney*, you need not be so punctual as to the time ; yet for the benefit of what you let stand observe the *Moons* increase. The *Reason* of these *differences*, is ; because *this* is the best reason for the *growth* of the *Tree* which you do *not* fell, the other for the *durableness* of the *Timber* which you *do* : Now that which is to be *burnt* is not so material for *lasting*, as the *growth* of the *Tree* is considerable for the *Timber* : But of these *particulars* more at large in *Cap. 30.*

14. The very *stumps* of *Oak*, especially that part which is dry, and above ground being well *grubb'd*, is many times worth the pains and charge, for sundry rare, and *hard* works ; and where *Timber* is dear. I could name some who abandoning this to work-

men for their *pains* only, when they perceiv'd the great advantage, repented of their *Bargain*, and undertaking it themselves, were gainers above half: I wish only for the expedition of this *knotty* work, some effectual *Engine* were devised; such as I have been told a *worthy* Person of this *Nation* made use of, by which he was able with *one man* to perform *more* than with *twelve Oxen*; and surely, there might be much done by fastning of *Iron hooks* and *fangs* about one Root to extract another; the *hook* chayn'd to some portable *Screw* or *Winch*: I say such an invention might effect wonders not only for the extirpation of *Roots*, but the prostrating of huge *Trees*: That small *Engine*, which by some is cal'd the *German-devil*, reform'd, after this manner, and duely applied, might be very expedient for this purpose, and therefore we have exhibited the following figure and submit it to improvement.



A The hand that keeps the Rope, b close upon the Cylinder c which is moved by a Pinnion of three or four teeth : d which moves a larger Iron Wheel f. e the Handle put upon the Spindle of the Pinnion, to turne it withall.

The whole Frame is let into a bigger piece of Wood, viz. h being about four foot in length, and one in breadth, and the other end of the Roller or Cylinder, is sustain'd by a lesser block of Wood (i) g the Plate which holds the Wheel and Pinnion in the larger block. Note,

That the Cylinder may be made of good tough Iron, about four inches in diameter, and fourteen or sixteen inches in length, and the tooth'd Wheel f of the like stuff, and of a thicknesse proportionable.

But this is to be practis'd only where you design a final extirpation ; for some have drawn suckers even from an old stub root ; but they certainly perish by the Moss which invades them, and are very subject to grow rotten. Pliny speaks of one Root which took up an intire Acre of Ground, and Theophrastus describes the *Lycean Platanus* to have spread an hundred foot ; if so, the Argument may hold good for their growth after the Tree is come to its period. They made Cups of the Roots of Oak heretofore, and such a curiosity Athenaus tells us was carv'd by *Thericleus* himself ; and there is a way so to tinge Oak after long burying and soaking in Water, which gives it a wonderfull politure, as that it has frequently been taken for a course Ebony.

15. There is not in nature a thing more obnoxious to deceit, then the buying of Trees standing, upon the reputation of their Appearance to the eye, unless the Chapman be extraordinarily judicious ; so various are their bidden, and conceal'd Infirmities, till they be fell'd, and sawn out : so as if to any thing applicable, certainly there is nothing which does more perfectly confirm it then the most flourishing out-side of Trees, *Fonti nulla fides*. A Timber-tree is a Merchant Adventurer, you shall never know what he is worth, till he be dead.

16. Oaks are in some places (where the soil is specially qualified) ready to be cut for Cops in fourteen years and sooner ; I compute from the first semination ; though it be told as an instance of high encouragement (and as indeed it merits) that a Lady in Northamptonshire sowed Acorns, and liv'd to cut the Trees produc'd from them, twice in two and twenty years ; and both as well grown as most are in sixteen or eighteen. This yet is certain, that Acorns set in Hedg-rows have in thirty years born a stem of a foot diametre. Generally, Copps wood should be cut close, and at such Intervals as the growth requires ; which being seldom constant, depends much on the places, and the kinds, the mould and the air, and for which there are extant particular Statutes to direct us, of all which more at large hereafter. Oak for Tan-bark may be fell'd from April to the last of June, by a Statute in the 1 Jacobi.

17. To enumerate now the incomparable *Uses* of this *Wood*, were needlesse: But so precious was the esteem of it, that of *Old* there was an expresse *Law* amongst the *Twelve Tables* concerning the very gathering of the *Acorns*, though they should be found fallen into another mans *Ground*: The *Land* and the *Sea* do sufficiently speak for the improvement of this excellent material; *Houses*, and *Ships*, *Cities*, and *Navies* are built with it; and there is a *kind* of it so *tough*, and extreemly compact, that our sharpest *Tools* will hardly enter it, and scarcely the very *Fire* it self, in which it consumes but slowly, as seeming to partake of a *ferruginous*, and *mettallin* shining nature, proper for sundry robust *Uses*; It is doubtlesse of all *Timber* hitherto known, the most universally usefull and strong; for though some *Trees* be harder, as *Box*, *Cornus*, *Ebony*, and divers of the *Indian Woods*; yet we find them more fragil, and not so well qualified to support great incumbencies and weights, nor is there any *Timber* more *lasting* which way soever us'd: There has (we know) been no little stir amongst Learned men of what material the *Cross* was made, on which our blessed *Saviour* suffer'd: The contentions about it are very great: but, besides *Lipsius*, *Angelus Rocca*, *Alphonsus Ciaconus*, and divers others, writing on this subject, and upon accurate examination of the many fragments pretended to be parcells of it; 'tis generally concluded to have been the *Oak*, and I do verily believe it; since those who have described those *Countries*, assure us there is no *Tree* more frequent, which with relation to severall celebrations and *Mysteries* under *Oaks* in the *Old Testament*, has been the subject of many fine discourses. That which is *twin'd*, and a little *wreath'd* (easily to be discern'd by the *texture* of the *Bark*) is best to support *Burthens*, for *Posts*, *Columns*, *Summers*, &c. for all which our *English Oak* is infinitely preferable to the *French*, which is nothing so usefull, nor comparably so strong; inso much as I have frequently admir'd at the sudden failing of most goodly *Timber* to the *Eye*, which being imploy'd to these *Uses* does many times most dangerously flie in sunder, as wanting that native *spring*, and *toughness*, which our *English Oak* is indu'd withall. And here we forget not the stressle which Sir *H. Wotton* and other *ArchiteEs* put even in the very *position* of their growth, their native streightnesse and loftinesse, for *Columns*, *Supporters*, *Cross-beams*, &c. and 'tis found that the rough grain'd body of a *flubbed Oak*, is the fittest *Timber* for the *Cafe* of a *Sider-Mill*, and such like *Engines*, as best enduring the unquietnesse of a ponderous *Rolling-stone*. For *Shingles*, *Pales*, *Lathes*, *Coopers ware*, *Clap-board* for *Wainscot*, and some pannells, are curiously vein'd, of much esteem in former times, till the finer grain'd *Norway Timber* came amongst us, which is likewise of a whiter colour: It is observ'd that *Oak* will not easily *glue* to other *Wood*; no not very well with its own kind; and some sorts will never cohere tolerably, as the *Box* and *Horn-beam*, though both hard woods; so nor *Service* with *Cornell*, &c. *Oak* is excellent for *Wheel-spokes*, *Pinns* and *Peggs* for *Tyling*, &c. Mr. *Blith* makes
Sparrs,

sparrs and small building-*Timber* of *Oaks* of eleven years growth, which is a prodigious advance, &c. the smallest and straightest is best; discover'd by the upright *tenor* of the *Bark*, as being the most proper for *cleaving*: The *knottiest* for *Water-works*, *Piles* and the like; because 'twill drive best, and last longest, the crooked, yet firm, for *knee-timber* in *Shipping*, *Mill-wheels*, &c. Were planting of these *Woods* more in use, we should banish our *hoops* of *Hazel*, &c. for those of good coppet *Oak*, which being made of the younger *shoots*, are exceeding tough and strong: One of them being of *Ground-Oak* will out-last six of the best *Ash*; but this our *Coopers* love not to hear of, who work by the *great* for *Sale*, and for others. The smaller trunchions, and *spray*, make *Billet*, *Bavine* and *Coals*; and the *Bark* is of price with the *Tanner* and *Dyer*, to whom the very *Saw-dust* is of use, as are the *Ashes* and *Lee* to cure the *roapishness* of *Wine*: And 'tis probable the *Cups* of our *Acorns* would tan *Leather* as well as the *Bark*. The *Ground-Oak* while young is us'd for *Poles*, *Cudgels* and *walking-staffs*, much come into mode of late, but to the *wast* of many a hopefull *Plant* which might have prov'd good *Timber*; and I the rather declaime against the Custom, because I suspect they are such as are for the most part cut and *stolen* by *idle* Persons, and brought up to *London* in great bundles, without the knowledg or leave of the *Owners*, who would never have glean'd their *Coppes* for such trifling uses: Here I am again to give a general notice of the peculiar excellency of the *Roots* of most *Trees*, for fair, beautifull, *chamleted*, and lasting *Timber*, applicable to many purposes; such as formerly made *Hasts* for *Daggers*, *Hangers*, *Knives*, *Handles* for *staves*, *Tobacco-Boxes*, and elegant *Joyners-work*, and even for some *Mathematical Instruments* of the larger size, to be had either in, or neer the *Roots* of many *Trees*; however 'tis a kindnesse to premonish *Stewards* and *Surveyors*, that they do not negligently wast those *materials*: Nor may we here omit to mention the *Galls*, *Mistletoe*, *Polypod*, *Agaric* (us'd in *Antidots*) *Vna*, *Fungus*'s to make *Tinder*, and many other usefull *Excrescencies*, to the number of above *twenty*, which doubtlesse discovers the variety of *transudations*, *percolations* and *textures* of this admirable *Tree*. *Pliny* affirms that the *Galls* break out altogether in one *night* about the beginning of *June*, and arrive to their full growth in one *day*; this I recommend to the experience of some extraordinary vigilant *Wood-man*. *Galls* are of several kinds, but grow upon a different *species* of *Robur* from any of ours, which never arive to any maturity; the *white* and *imperforated* are the best. What benefit the *Mast* does univerfally yield for the fatting of *Hogs* and *Deer* I shall shew upon another occasion, before the conclusion of this Discourse. A *Peck* of *Acorns* a day, with a little *Bran*, will make an *Hog* ('tis said) increase a pound-weight *per diem* for two moneths together. They give them also to *Oxen* mingled with *Bran*, chop'd or broken; otherwise they are apt to sprout and grow in their bellies. Others say, they should first be macerated in *water*, to extract their malignity; *cattel* many times

times perishing without this preparation. *Cato* advises the *Husband-man* to reserve 240 bushels of *Acorns* for his *Oxen*, mingled with a like quantity of *Beans* and *Lupines*, and to drench them well. But in truth they are more proper for *Swine*, and being so made small will fatten *Pigeons*, *Peacocks*, *Turkies*, *Pheasants*, and *Poultry*: nay 'tis reported, that some *Fishes* feed on them, especially the *Tunny*, in such places of the coast where trees hang over Arms of the Sea. *Acorns* were heretofore the food of *Men*, nay of *Jupiter* himself, (as well as other productions of the Earth) till their luxurious palats were debauched: and even in the *Romans* time, the custom was in *Spain* to make a second service of *Acorns* and *Mast*, (as the *French* now do of *Marrons* and *Chestnuts*) which they likewise used to roast under the embers.

————— Fed with the Oaken Mast
The aged Trees themselves in years surpafs'd.

————— Et quernâ glande repaſca
Æquifſte annosâs vivendo corpora Quercus.

And men had indeed hearts of Oak; I mean, not so hard, but health, and strength, and liv'd naturally, and with things easily parable and plain.

Blest Age o'th' World, just Nymph, when *Man* did
Under thy shade, whence his provision fell; (dwell
Salads the meal: Wildings were the Diet,
No Tree yet learn'd by ill-exampled Art
With insidious fruits to symbolize,
As in an Emblem, our Adulteries.

Felix illa ætas mundi juſtiſſima Nymphæ,
Cum dabat umbra domum vivam tua, cum domus ipſa
Decidua Dominos paſcebat fruge quietos,
Solique præbant Sylveſtria poma ſecundas
Gramineis epulas menſis: nondum arte magiſtrâ
Arbor Adulterii præluſerat inſita miſtris, &c.

Couleii Pl. L. 6.

as the sweet Poet bespeaks the *Dryad*; But 'tis in another place where I shew you what this *Acorn* was; and even now I am told, that those small young *Acorns* which we find in the *Stock-doves* Crows, are a delicious fare, as well as those incomparable *Salads* of young herbs taken out of the maws of *Partridges* at a certain season of the year, which gives them a preparation far exceeding all the art of *Cookery*. Oaks bear also a knur, full of a cottony matter, of which they anciently made *Wick* for their *Lamps* and *Candles*; and among the *Selecſtiora Remedia* of *Jo. Prævotius* there is mention of an Oil è querna glande Chymically extracted, which he affirms to be of the longest continuance, and least consumptive of any other whatsoever, for such lights, ita ut uncia singulis menſibus vix abſumatur continuo igne. The leaves of Oaks abundantly congested on *Snow*, preserves it as well for wine, as a deep pit, or the most artificial *Refrigeratory*. *Varro* affirms, they made *Salt* of Oak ashes, with which they sometimes seasoned meat, but more frequently made use of it to sprinkle among and fertilize their seed-corn: which minds me of a certain Oak found buried somewhere in *Transſylvania*, near the salt-pits, that was intirely converted into an hard salt, when they came to examine it by cutting. This experiment (if true) may possibly encourage some other attempts for the multiplying of *Salt*. Of the *Galls* is made the ground and basis of *Inks* and several *Dyes*, especially sadder colours, and are a great revenue to those who have quantities of them. The very *Mosse* of the

the *Oak*, viz. that which is *white*, composes the choicest *Cypresse-powder*, which is esteemed good for the head: but *Impostors* familiarly vend other *Mosses* under that name, as they do the *Fungi* for the true *Agaric*, to the great scandal of *Physick*. Young red *Oaken* leaves decocted in *wine*, make an excellent gargle for a sore *mouth*: and almost every part of this *Tree* is sovereign against *Fluxes* in general. The *dew* that impearls the leaves in *May*, insolated, meteorizes and sends up a *liquor*, which is of admirable effect in *Ruptures*: And a *water* distill'd from the *Acorns* are good against the *Phthisick*, *Stitch* in the side, and heals inward *Ulcers*, breaks the *Stone*, and refrigerates *Inflammations*, being applied with *Linnen* dip'd therein: nay, the *Acorns* themselves eaten fasting kill the *worms*, provoke *urine*, and (some affirm) break even the *Stone* it self. The *Coals* of *Oak* beaten and mingled with *honey*, cures the *Carbuncle*; to say nothing of the *Viscons's*, *Polypods*, and other *Excre-scences*, of which innumerable *Remedies* are composed, noble *Antidotes*, *Syrups*, &c. Nay, 'tis reported, that the very *shade* of this *tree* is so wholesom, that the *sleeping* or lying under it becomes a present *remedy* to *Paralyticks*, and recovers those whom the mistaken malign influence of the *Walnut-tree* has smitten. To conclude, and upon serious meditation of the various uses of *this* and other *trees*, we cannot but take notice of the admirable *Mechanism* of *Vegetables* in general; as in particular in this *species*; that by the diversity of *Percolations* and *Strainers*, and by mixtures as it were of divine *Chymistry*, various *concoctions*, &c. the *sap* should be so green on the indented *leaves*, so lustily *esculent* for our hardier and rustick *Constitutions* in the *fruit*; so flat and palid in the *Atramental Galls*; and haply so prognostick in the *Apple*; so *Suberous* in the *Bark* (for even the *Cork tree* is but a *courser Oak*) so *Oozie* in the *Tanners pit*; and in that subduction so wonderfully *specifick* in corroborating the *Entrails*, and *Bladder*, *Reins*, *Loins*, *Back*, &c. which are all but the gifts and qualities, with many more, that these robust *sons of the Earth* afford us; and that in other *specific's*, even the most despicable and vulgar *Elder* imparts to us in its *rind*, *leaves*, *buds*, *bloffoms*, *berries*, *ears*, *pith*, *bark*, &c. Which hint may also carry our remarks upon all the varieties of *Shape*, *Leaf*, *Seed*, *Fruit*, *Timber*, *Grain*, *Colour*, and all those other *forms* that *Philosophers* have enumerated; but which were here too injurious for us to repeat. Let us end with the *Poet*:

When Ships for bloody combat we prepare,
Oak affords plank, and arms our Men of War;
Maintains our fires, makes plows to till the ground,
For use no Timber like the Oak is found.

Si quando armandæ naves, & bella parandæ,
Det quercus nautis tabulata, det arma furorî
Bellantum; det ligna foco, det aratra colono,
Aut aliis aliis porro sumatur in usus.

Rapinus.

CHAP. IV.

Of the Elm.

Elm.

1. **U** *Linus* the Elm, There are four, or five sorts, and from the difference of the *Soil* and *Air* divers *spurious*: Two of these kinds are most worthy our culture, the vulgar, viz. the *Mountain Elm*, which is taken to be the *Oriptelea* of *Theophrastus*; being of a lesse jagged and smaller leaf; and the *Vernacula* or *French Elm*, whose leaves are thicker, and more florid, *glabrous* and smooth, delighting in the lower and moister grounds, where they will sometimes rise to above an hundred foot in height; and a prodigious growth, in lesse than an *Age*; my self having seen one planted by the hand of a *Countesse* yet living, which is neer *twelve* foot in *compass*, and of an *height* proportionable; notwithstanding the numerous progeny which grows under the shade of it, some whereof are at least a foot in *Diameter*, that for want of being seasonably *transplanted*, must needs have hindered the procerity of their ample and indulgent *Mother*: I am persuaded some of these are *Viviradices* & *Traduces* product of the falling seeds.

2. For though both these sorts are rais'd of *Appendices* or *Suckers* (as anon we shall describe) yet this latter comes well from the *Samera* or *Seeds*, and therefore I suppose it to be the antient *Attinea*, for such an Elm they acknowledge to be rais'd of *Seeds*, which being ripe about the beginning of *March* (though frequently not till the following Month) will produce them; as we see abundantly in the *Gardens* of the *Thuylleries*, and that of *Luxembourg*, at *Paris*; where they usually sow themselves and come up very thick; and so do they in many places of our Countrey, though so seldom taken notice of, as that it is esteemed a *fable*, by the lesse observant and ignorant vulgar; let it be tryed in *season*, by turning and raking some fine earth, often refreshed under some amply spreading *Tree*, or to raise them of their *Seeds* (being well dryed a day or two before) sprinkled in *Beds* prepar'd of good earth, and sieving some of the finest mould thinly over them, and watering them when need requires. Being risen an inch above ground (refreshed and preserved from the scraping of *Birds* and *Poultry*) comfort the tender *seedlings* by a second sieving of more fine earth, to establish them; thus keep them clean *weeded* for the first *two years*; or till being of fitting stature to *remove*, you may *thin*, and *Transplant* them in the same manner as you were directed for young *Oaks*; only they shall not need above one cutting, where

where they grow leſſe regular and hopeful. But becauſe this is an *Experiment* of ſome *curioſity*, obnoxious to many casualties, and that the producing them from the *Mother-roots* of greater Trees is very facile and expeditious (beſides the numbers which are to be found in the *Hedge-rows*, and *Woods*, of all plantable ſizes) I rather adviſe our *Foreſter* to furniſh himſelf from thoſe places.

3. The *Suckers* which I ſpeak of are produced in abundance from the *Roots*, whence, being *dextrouſly* ſeparated, after the Earth has been well looſned, and planted about the end of *October*, they will grow very well: Nay, the *ſtubs* onely, which are left in the ground after a felling (being fenced in as far as the *Roots* extend) will furniſh you with plenty, which may be *transplanted* from the *fiſt year* or *two*, ſucceſſively, by ſlipping them from the *Roots*, which will continually ſupply you for many years after that the body of the Mother-tree has been cut down: And from hence probably is ſprung that (I fear) miſtake of *Salmaſius* and others, where they write of the growing of their *Chips* (I ſuppoſe having ſome of the Bark on) ſcattered in hewing of their *Timber*; the *Error* proceeding from this, that after an *Elm-tree* has been *fell'd*, the numerous *Suckers* which ſhoot from the remainders of the *latent* *Roots*, ſeem to be produced from this diſperſion of the *Chips*: Let this yet be more accurately examined; for I pronounce nothing *Magiſterially*, ſince it is ſo confidently reported.

4. I have known *Stakes* ſharpned at the ends for other purpoſes, take root familiarly in moiſt grounds, and become *Trees*; and divers have eſſay'd with extraordinary ſucceſs the trunchions of the Boughs and Arms of *Elms* cut to the ſcantling of a mans arm, about an *ell* in length. Theſe muſt be chopp'd on each ſide oppoſite, and laid into *trenches* about half a foot deep, covered about two or three fingers deep with good mould. The ſeaſon for this work is towards the *exit* of *January*, or early in *February* if the Froſts impede not, and after the fiſt year, you may cut or ſaw the *trunchions* off in as many places as you find cauſe, and as the ſhoots and rooted Sprouts will direct you for *transplantation*. Another expedient for the propagation of *Elms* is this; let *trenches* be ſunk at a good diſtance (*viz.* twenty or thirty *yards*) from ſuch Trees as ſtand in *Hedge-rows*, and in ſuch order as you deſire your *Elms* ſhould grow; where theſe gutters are, many young *Elms* will ſpring from the ſmall roots of the adjoining Trees, divide (after one year) the *ſhoots* from their *Mother-roots*, which you may dextrouſly do with a ſharp *ſpade*: Theſe *transplanted*, will prove good Trees without any damage to their Progenitors. Or do thus, Lop a young *Elm*, the *lop* being about three years growth, do it in the latter end of *March*, when the *Sap* begins to creep up into the Boughs, and the *Buds* ready to break out; cut the Boughs into lengths of four foot ſlanting, leaving the *knot* where the *bud* ſeems to put forth in the middle:

Interr these short pieces in *trenches* of three or four inches deep, and in good *mould* well trodden, and they will infallibly produce you a Crop, for even the smallest *Suckers* of *Elms* will grow being set when the *Sap* is newly stirring in them: There is yet a fourth way no less expeditious, and frequently confirmed with excellent success: Bare some of the Master-roots of a vigorous *Tree* within a foot of the *Trunk*, or thereabouts, and with your *Ax* make several Chops, putting a small stone into every *cleft*, to hinder their closure, and give access to the *wet*; then cover them with three, or four *inch* thick of Earth; and thus they will send forth *Suckers* in abundance (I assure you one single *Elm* thus well ordered, is a fair *Nursery*) which after two or three years, you may separate, and plant in the *Ulmarium*, or place designed for them; and which if it be in *Plumps* (as they call them) within ten or twelve foot of each other, or in *Hedge-rows*, it will be the better: For the *Elm* is a *Tree* of *Consort*, *Sociable*, and so affecting to grow in Company, that the very best which I have ever seen do almost touch one another: This also protects them from the *Winds*, and causes them to shoot of an extraordinary *height*; so as in little more than *forty years*, they even arrive to a load of *Timber*; provided they be sedulously and carefully cultivated, and the *Soil* propitious. For an *Elm* does not thrive so well in the *Forest*, as where it may enjoy scope for the *Roots* to dilate and spread at the sides, as in *Hedge-rows* and *Avenues*, where they have the *Air* likewise free.

5. There is besides these sorts we have named, one of a more *Scabrous* harsh leaf, but very large, which becomes an huge *Tree*, and is distinguished by the name of the *Witch-hazel* in our Statute Books, as serving formerly to make *long Bowes* of; but the *Timber* is not so good as the *first* more vulgar; but the *Bark* at time of year, will serve to make a course *bast-rop*e with.

6. Of all the *Trees* which grow in our *Woods*, there is none which does better suffer the Transplantation than the *Elm*; for you may remove a tree of *twenty years* growth with undoubted success: It is an Experiment I have made in a *Tree* almost as big more as my waste; but then you must totally *disbranch* him, leaving onely the *Summit* intire; and being careful to take him up with as much *Earth* as you can, refresh him with abundance of *water*. This is an excellent, and expeditious way for great Persons to plant the *Accesses* of their Houses with; for being disposed at sixteen, or eighteen foot *interval*, they will in a few years bear goodly heads, and thrive to admiration. Some that are very cautious, *emplaster* the wounded head of such over-grown *Elms* with a mixture of *clay* and *horse-dung*, bound about them with a wisp of *Hay* or fine *Moss*, and I do not reprove it, provided they take care to temper it well, so as the *Vermine* nestle not in it. But for more ordinary plantations, younger *Trees*, which have their *bark* smooth and tender, about the scantling of your leg, and their heads trimm'd at five or six foot height, are to be prefer'd before

fore all other. *Cato* would have none of these sorts of *Trees* to be removed till they are five or six fingers in *diameter*; others think they cannot take them too young; but experience (the best *Mistris*) tells us, that you can hardly plant an *Elm* too big. There are who pare away the *Root* within two fingers of the *stem*, and quite cut off the *Head*; but I cannot commend this extreme severity, no more than I do the strewing of *Oats* in the pit; which *fermenting* with the moisture, and frequent *waterings*, is believed much to *accelerate* the putting forth of the *Roots*; not considering, that for want of *air* they corrupt, and grow musty, which more frequently suffocates the *Roots*, and endangers the whole *Tree*.

7. I have affirmed how patient this *Tree* is of *Transplantation*; not onely for that I observe so few of them to grow wild in *England*, and where it may not be suspected; but they, or their predecessors have been planted by some industrious hand; but for that those incomparable *Walkes* and *Vistas* of them both at *Aranjuez*, *Casa del Campo*, *Madrid*, the *Escorial*, and other places of delight belonging to the *King* and *Grandees* of *Spain*, are planted with such as they report *Philip* the second caused to be brought out of *England*; before which (as that most Honourable Person the Earl of *Sandwich* now his Majesties Ambassador Extraordinary, at that *Court* writes to me) it does not appear there were any of those *Trees* in all *Spain*. In that Princely Seat it is, that double rows of them are planted in many places for a *league* together in length; and some of them *fourty yards* high, which are kept stript up to the very top branch, which must needs render a most glorious, and agreeable effect; no *Tree* whatsoever, becoming long *Walks* and *Avenues*, comparably to this Majestick plant: But hear it as sweetly advised as described;

An *Elm* for graceful verdure, bushy bough,
A lofty top, and a firm rind allow.
Plant *Elm* in borders, on the *Grasse* - plots list,
Branches of *Elm* into thick *Arbours* twist;
A Gallery of *Elm* draw to the end
That Eyes can reach, or a breath'd race extend.

Ut viror est ulmo latus, ramisque comanter,
Arduus, alta petens & levi cortice truncus.
Ulmum adhibe ordinibus, quoribus fundenda per hortum,
Sum seris spatia ingenti, texendaque totis,
Æstivos contra soles umbracula campis:
Una alias inter texendis aptior ulmus
Marginibus spatiorum, exornandoque vireta.
Seque adeo series, plano super aquore, tendas
Ulmorum tractu longo; quantum ipsa tuentum
Lumina, vel gressus valent lustrare sequentum.

Rapinuz.

8. The *Elm* delights in a *sound*, *sweet*, and *fertile* Land, something more inclined to moisture, and where good pasture is produced; though it will also prosper in the gravelly, provided there be a competent depth of *mould*, and be refreshed with Springs; in defect of which, being planted on the very surface of the ground (the *swarth* par'd first away, and the earth stirred a foot deep or more) they will undoubtedly succeed; but in this *trial*, let the *Roots* be handsomly spread, and covered a *foot*, or more in height, and above all, firmly staked. This is practicable also

for other *Trees*, where the Soil is over moist, or unkind : For as the *Elm* does not thrive in too dry, sandy, or hot grounds, no more will it abide the cold and *spongy* ; but in places that are competently fertile, or a little elevated from these annoyances ; as we see in the *Mounds*, and castings up of Ditches, upon whose banks the *Female* sort does more naturally delight ; though it seems to be so much more addicted to *some* places than to others, that I have frequently doubted, whether it be a pure *Indigene* or *translative* ; and not onely because I have hardly ever known any considerable *Woods* of them (besides some few *Nurseries* neer *Cambridge*, planted I suppose for store) but almost continually in *Tufts*, *Hedg-rows*, and *Mounds* ; and that *Shropshire*, and several other Counties, have rarely, any growing in many miles together.

9. The *Elm* is by reason of its aspiring, and tapering growth (unlesse it be topped to enlarge the *Branches*, and make them spread low) the least offensive to Corn and *Pasture grounds*, to both which, and the *Cattel*, they afford a benign shade, defence, and agreeable Ornament.

10. It would be planted as shallow as might be ; for, as we noted, deep interring of *Roots* is amongst the *Catholick* mistakes ; and of this, the greatest to which *Trees* are obnoxious. Let new planted *Elms* be kept moist by frequent refreshings upon some half-rotten *Fern*, or *Litter* laid about the foot of the *stem* ; the earth a little stirred and depressed for the better reception, and retention of the *Water*.

11. Lastly, your Plantation must above all things be carefully preserved from *Cattel*, and the concussions of impetuous *Winds*, till they are out of reach of the one, and sturdy enough to encounter the other.

12. When you lop the side-boughs of an *Elm* (which may be about *January* for the Fire, and more frequently, if you desire to have them tall ; or that you would form them into *Hedges* (for so they may be kept *plashed*, and thickned to the highest twig ; affording both a magnificent, and august defence against the *Winds* and *Sun*) I say, when you trim them, be careful to indulge the tops ; for they protect the body of your *Trees* from the wet, which alwayes invades those parts first, and will in time *perish* them to the very heart ; so as *Elms* beginning thus to decay, are not long prosperous. Sir *Hugh Plat* relates (as from an expert Carpenter) that the boughs and branches of an *Elm* should be left a foot long next the *trunk* when they are lop'd ; but this is to my certain observation a very great mistake either in the *Relator*, or *Authour* ; for I have noted many *Elms* so disbranched, that the remaining *stubs* grew immediately hollow, and were as so many *Conduits* or *Pipes*, to hold, and convey the *Rain* to the very body and heart of the Tree.

13. There is a *Cloyster* of the right French *Elm* in the little Garden neer to her Majesties the Queen Mothers Chappel at *Somerset-house*, which were (I suppose) planted there, by the industry of the

the *F. F. Capuchines*, that will perfectly direct you to the incomparable use of this noble *Tree* for *shade* and *delight*, into whatever *figure* you will accustom them. I have my self procured some of them from *Paris*, but they were so abused in the Transportation, that they all perished save *one*, which now flourishes with me : I have also heard of grafting *Elms* to a great improvement of their heads : *Virgil* tells us they will joyn in Marriage with the *Oak*, and they would both be tryed ; and that with the more probable successe, for such *lignous* kinds, if you *graff* under the Earth, *upon*, or *neer* the very Root it self, which is likely to entertain the *Cyon* better than when more exposed, till it be well fixt, and have made some considerable progresse.

14. When you would *Fell*, let the *Sap* be perfectly in repose ; as 'tis commonly about *November* or *December*, after the *frost* hath well nipp'd them : I have already alleadged my reason for it ; and I am told, that both *Oak* and *Elm* so cut, the very *Saplings* (whereof *Rafters*, *Spars*, &c. are made) will continue as long as the very *heart* of the *Tree*, without decay. In this work, cut your kerle neer to the ground ; but have a care that it suffer not in the *fall*, and be ruined with its own weight : This depends upon your *Wood-mans* judgment in *disbranching*, and is a necessary caution to the *Felling* of all other *Timber-trees*. If any begin to *doat*, pick out such for the *Ax*, and rather trust to its *Successor*.

15. *Elm* is a *Timber* of most singular use ; especially where it may lie continually *dry*, or *wet*, in extreames ; therefore proper for *Water-works*, *Mills*, *Pipes*, *Pumps*, *Aquaeducts*, *Ship-planks* beneath the *Waterline* ; and some that has been found buried in *Bogs* has turned like the most polish'd, and hardest *Ebony*, onely discerned by the grain : Also for *Wheel-wrights*, *Handles* for the *single Hand-saw*, the knotty for *Naves*, the straight and smooth for *Axel-trees*, and the very *Roots* for curiously dappled works, scarce has any superior for *Kerbs* of *Coppers*, *Featheridge*, and *Weather-boards*, *Chopping-blocks*, *Blocks* for the *Hatmaker*, *Trunks*, and *Boxes* to be covered with *leather* ; for *Dressers*, and *Shovel-board-Tables* of great length, and a lustrous *Colour* if rightly seasoned ; also for the *Carver*, by reason of the tenor of the grain, and toughness which fits it for all those curious works of *Frutages*, *Foleage*, *Shields*, *Statues*, and most of the *Ornaments* appertaining to the *Orders* of *Architecture* ; and for not being much subject to warping ; I find that of old they used it even for *hinges* and *books* of *Doors* ; but then, that part of the *Plank*, which grew towards the top of the *Tree*, was in work to be alwayes reversed : But besides these and sundry other employments, it makes also the second sort of *Charcoal* ; and finally (which I must not omit) the use of the very *leaves* of this *Tree*, especially of the *female*, is not to be despis'd ; for being suffered to dry in the *Sun* upon the *Branches*, and the *spray* strip'd off about the decrease in *August* (as also where the suckers and *stolones* are super-numerary, and hinder the thriving of their *Nurses*) they will
prove

prove a great relief to *Cattel* in *Winter*, and scorching *Summers*, when *Hay* and *fodder* is dear; they will eat them before *Oates*, and thrive exceedingly well with them; remember onely to lay your *Boughs* up in some dry and sweet corner of your *Barn*: It was for this the *Poet* prais'd them, and the *Epithite* was advis'd,

Fruitful in leaves the Elm.

— *fecunda frondibus Ulmi.*

Georg. 2.

In some parts of *Herefordshire* they gather them in *Sacks* for their *Swine*, and other *Cattel* according to this Husbandry. But I hear an ill report of them for *Bees*, that surfeiting of the blooming *Seeds*, they are obnoxious to the *Lark*, at their first going abroad in *Spring*, which endangers whole *Stocks*, if *Remedies* be not timely adhibited; therefore 'tis said in great *Elm* Countries they do not thrive, but the truth of which I am yet to learn. The *Green* leaf of the *Elms* contused, heales a *green wound* or *Cut*, and boyled with the *Bark* consolidates fractur'd bones.

CHAP.

CHAP. V.

Of the Beech.

1. **T**He *Beech*, [*Fagus*] (of two or three kinds) and num-
 bred amongst the glandiferous Trees, I rank here before
 the martial *Ash*, because it commonly grows to a greater stature.
 But here I may not omit a Note of the accurate *Critus Palme-*
rius, upon a passage in *Theophrastus*, where he *Animadverts* upon
 his *Interpreter*, and shews that the antient *Φηγύς* was by no means
 the *Beech*, but a kind of *Oak*; for that the figure of the fruit is
 so widely unlike it; that being round, this triangular; and both
Theophrastus and *Pausanias* make it indeed a Species of *Oak*,
 wholly differing in *Trunk*, as well as *Fruit* and *Leaf*, to which
 he adds (what determines the Controversie) *ξύλον τῆς Φηγύς ἰσχυ-*
ρότατον καὶ ἀσυνέκτατον, &c. That it is of a firm Timber, not obnoxious
 to the Worm, neither of which can so confidently be said of the
Beech. Yet *La Cerda* too seems guilty of the same mistake: But
 leaving this, there are of our *Fagi*, too or three kinds with us;
 the Mountain (where it most affects to grow) which is the whitest,
 and most sought after by the *Turner*; and the *Campestral* or wild,
 which is of a blacker colour, and more durable. They are both
 to be rais'd from the *Mast*, and govern'd like the *Oak* (of which
 amply) and that is absolutely the best way of furnishing a *Wood*:
 But they are likewise to be planted of young seedlings to be
 drawn out of the places where the fruitful Trees abound. In
transplanting them cut off onely the boughs and bruised parts, two
Inches from the stem, to within a yard of the top; but be very
 sparing of the *Root*: This, for such as are of pretty stature,
 They make spreading Trees, and noble Shades with their well-
 furnished and glistering leaves, being set at forty foot distance;
 but they grow taller, and more upright in the Forests, where I have
 beheld them at eight and ten foot, shoot into very long Poles;
 but neither so apt for Timber, nor Fuel: In the Vallies (where
 they stand warm and in Consort) they will grow to a stupendi-
 ous procerity, though the soyl be stony and very barren: Also
 upon the declivities, sides, and tops of high Hills, and *Chalkie*
Mountains especially; for they will strangely insinuate their roots
 into the bowels of those seemingly impenetrable places, not much
 unlike the *Fir* it self, which, with this so common Tree, the
 great *Cesar* denies to be found in *Britanny*, *Materia cujusque gene-*
ris, ut in Gallia, præter Fagum & abietem: But certainly from a
 grand mistake, or rather, for that he had not travelled much up
 into

Beech.

Exercit. in
Theophrast. l. 3.
c. 9.

In Arcad.

into the Countrey. *Virgil* reports it will graff with the *Chestnut*.

2. The *Beech* serves for various Uses of the Housewife;

Hence in the Worlds best years the humble *Shed*,
Was happily, and fully furnished : (*Stools*,
Beech made their *Chests*, their *Beds* and the *Joynd-*
Beech made the *Board*, the *Plasters*, and the *Bowles*.

Hinc olim juvenis Mundi melioribus annis
Fortunatarum domuum non magna Supellex
Tota petebatur; Sella, Armaria, Lectos.
Et Menfas dabat, & Lances, & pocula Fagus, &c.
Couleij Pl. l. 6.

with it the *Turner* makes *Dishes*, *Trays*, *Rimbs* for *Buckets*, and other *Utenfils*, *Trenchers*, *Dresser-boards*, &c. likewise for the *Wheeler*, *Joyner*, and *Upholster* for *Sellyes*, *Chairs*, *Stools*, *Bedsteads*, &c. for the *Bellows-maker*, and *Husbandman* his *Shovel* and *Spade-graffs*; *Floates* for *Fishers Nets* instead of *Cork*, is made of its *Bark*; for *Fuel*, *Billet*, *Bavin* and *Coal* though one of the least lasting: Not to omit even the very *Shavings* for the fining of *Wines*. *Peter Crescentius* writes, that the *Ashes* of *Beech* with proper mixture, is excellent to make *Glasse* with. If the *Timber lye* altogether under *water*, 'tis little inferior to *Elm*, as I find it practised and asserted by *Shipwrights*: Of old they made their *Vasa Vindimatoria* and *Corbes Messoriae* (as we our pots for *Strawberries*) with the *Rind* of this *Beech*, nay, and *Vessels* to preserve *Wine* in, and that curiously wrought *Cup* which the *Shepherd* in the *Buchollicks* wagers with all, was engraven by *Alcimedon* upon the *Bark* of this tree: And an happy age it seems:

— No Wars did men molest,
When onely Beechen-Bowles were in request.

— nec bella fuerunt,
Iuginus assabat dum Scyphus ante daper.
Tibul.

Of the thin *Lamina* or *Scale* of this wood (as our *Cutlers* call it) are made *Scabards* for *Swords* and *Bandboxes*, superinduc'd with thin *leather* or *Paper*, *Boxes* for *Writings*, *Hat-cases*, and formerly *Book-covers*. I wonder we cannot split it our selves but send into other *Countreys* for such trifles. In the *Cavities* of these *Trees*, *Bees* much delight to *Hive* themselves: Yet for all this, you would not wonder to hear me deplore the so frequent use of this *Wood*, if you did consider that the industry of *France* furnishes that *Country* for all domestic *Utenfils* with excellent *Walnut*; a material infinitely preferable to the best *Beech*, which is indeed good only for *shade* and for *fire*, as being brittle, and exceedingly obnoxious to the *Worm*, where it lyes either *dry*, or *wet* and *dry*, as has been noted; but being put ten dayes in *water*, it will exceedingly resist the *worm*. *Ricciolus* much commends it for *Oars*, and some say that the vast *Argo* was built of the *Fagus*, a good part of it at least, as we learn out of *Apolonius*; this will admit of Interpretation. But whilst we thus condemn the *Timber*, we must not omit to praise the *Mast*, which fats our *Swine* and *Deer*, and hath in some Families even supported men with bread: *Chios* indured a memorable Siege by the benefit of this *Mast*; and in some parts of *France* they now grind the *Buck* in *Mills*: It affords a sweet

Oyl

Oyl, which the poor People eat most willingly : But there is yet another benefit which this Tree presents us ; that its very *leaves* which make a natural, and most agreeable *Canopy* all the Summer ; being gathered about the Fall, and somewhat before they are much *frost-bitten*, afford the best and easiest *Mattraffes* in the world to lay under our *Quilts* instead of *straw* ; because, besides their tenderness and loole lying together, they continue sweet for seven or eight years long ; before which time *straw* becomes *rusty* and hard ; they are thus used by divers persons of quality in *Dauphine* ; and in *Switzerland* I have sometimes lain on them to my great refreshment ; so as of this Tree it may properly be said,

The Wood's an House ; the leaves a Bed.

— *Sylva domus, cubilia frondes.*

Juvenal.

The stagnant *water* in the hollow *Trees* cure the most obstinate *Tettars*, *Scabs*, and *Scurfs*, in *Man* or *Beast*, fomenting the part with it ; and the *Leaves* chew'd, are wholesome for the *Gums* and *Teeth*, for which the very *Buds*, as they are in Winter hardned and dried upon the twiggs, make good *Tooth pickers*. *Swine* may be driven to *Mast* about the end of *August*.

CHAP. VI.

Of the *Ash*.*Ash.*

1. **F***Raxinus* the *Ash*, is with us *Male* and *Female*, the one affecting the higher grounds : The other the plains, of a whiter wood, and rising many times to a prodigious stature ; so as in forty years from the *Key*, an *Ash* hath been sold for thirty pound *sterling* : And I have been credibly inform'd, that one Person hath planted so much of this one sort of *Timber* in his life time, as hath been valued worth *fifty thousand pounds* to be bought. These are pretty encouragements, for a small, and pleasant industry. That there is a *lower*, and more *knotty* sort, every *Husbandman* can distinguish.

2. The *Keys* being gathered when they begin to fall (which is about the end of *October*, and the ensuing Month) are to be sowed ; but not altogether so deep as your former *Masts* : Thus they do in *Spain* : from whence it were good to procure some of the *keys* from their best trees : A very narrow *Seminary* will be sufficient to store an whole *Country* : They will lye a full year in the ground before they appear ; therefore you must carefully *Fence* them all that time and have patience : But if you would make a considerable *Wood* of them at once, *Dig*, or *Plow* a parcel of ground, as you would prepare it for *Corn* and with the *Corn* (or what other *Grain* you think fittest) sow also good store of *Keys*, some *Crab-kernels*, &c. amongst them : Take off your Crop of *Corn*, or Seed in its *Season*, and the next year following it will be cover'd with young *Ashes*, which will be fit either to stand (which I prefer) or be *transplanted* for divers years after ; and these you will find to be far better then any you can gather out of the *Woods* (especially *Suckers*, which are worth nothing) being removed at one foot stature (the sooner the better) provided you defend them well from *Cattel* : The reason of this hasty *transplanting*, is to prevent their obstinate, and deep rooting ; *tantus amor terræ* — which makes them hard to be taken up when they grow older, and that being removed they take no great hold till the second year, after which, they come away again : Yet I have planted them of five and six inches *diametre*, which have thriven as well as the smaller *wands*. Cut not his *head* at all (which being young is pithy) nor, by any means, the fibrous part of the *Roots*, onely, that down-right, or *Tap-root* (which gives our *Husbandmen* so much trouble in drawing) is to be totally abated : But this work ought to be in the increase of *October*, or *November*, and not in the *Spring*. We are (as I told you) willing to spare his head ; because

because being yet young, it is but of a *spongie* substance; but being once well fixed, you may cut him as close to the earth as you please; it will cause him to shoot prodigiously; so as in a few years to be fit for *Pike-slaves*. Young *Ashes* are sometimes in *Winter frost-burnt*, black as Coals, and then to use the *knife* is seasonable, though they do commonly recover of themselves slowly. In *South-Spain* (where as we said are the best) after the first dressing, they let them grow till they are so big, as being cleft into four parts, each part is sufficient to make a *Pike-staff*: I am told there is a *Flemish Ash* planted by the *Dutchmen* in *Lincolnshire*, which in six years grows to be worth *twenty shillings* the Tree; but I am not assur'd whether it be the *Ash* or *Abeele*; either of them were, upon this account, a worthy encouragement. From these low Cuttings come our *Ground-Ashes*, so much sought after for *Arbours*, *Espaliers*, and other *Pole-works*: They will spring in abundance, and may be reduced to one for a *Standard-tree*, or for *Timber*, if you design it; for thus *Hydra* like, a *Ground-cut-Ash*,

By havock, Wounds, and Blows,
More lively and luxuriant grows.

*Per damna, per caedes, ab ipso
Ducit opes ausimunque ferre.*

Hor.

Ash will be propagated from a *Bough* split off with some of the *old-wood*, a little before the *Bud* swells. Such as they reserve for *Spears* in *Spain*, they keep shrip'd up close to the *stem*, and plant them in close order, and moyster places. These they cut above the *knot* (for the least *nodosity* spoils all) in the decrease of *January*, which were of the latest for us: It is reported that the *Ash* will not onely receive its own kind, but *graff*, or be *inoculated* with the *Pear* and *Apple*, but to what improvement I know not.

3. It is by no means convenient to plant *Ash* in *Plow-lands*; for the *Roots* will be obnoxious to the *Coulter*; and the *shade* of the Tree is malignant to *Corn* when the head and branches over-drip it; but in *Hedge-rows*, and *Plumps*, they will thrive exceedingly, where they may be dispos'd at nine or ten foot distance, and sometimes neerer: But in planting of a whole *Wood* of several kinds of Trees for *Timber*, every third set at least, would be an *Ash*. The best *Ash* delights in the best Land (which it will soon impoverish) yet grows in any; so it be not over-wet, and approaching to the *Marshy*, unless it be first well drain'd: By the Banks of sweet and crystal *Rivers* and Streams, I have observ'd them to thrive infinitely. One may observe as manifest a difference in the Timber of *Ashes*, as of the *Oak*; much more than is found in any one kind of *Elm*, *ceteris paribus*: For so the *ground-Ash* (like the *Oak*) much excels a bough, or branch of the same bulk, for strength and toughnesse; and in yet farther emulation of the *Oak*, it has been known to prove as good, and lasting *Timber* for *Building*, nay, preferr'd before it, where there has

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been plenty of *Oake*; vast difference there is also in the strength of *Ground*, and *quarter'd Ash*: 'Tis likewise remarkable that the *Ash*, like the *Cork tree*, grows when the *Bark* is quite peel'd off, as has been observ'd in several *Forests*, where the *Deer* have bared them as far as they could climb: Some *Ash* is curiously camleted and vein'd, I say, so differently from other *Timber*; that our skilful *Cabinet-makers* prize it equal with *Ebony*, and give it the name of *green Ebony*, which the *Customer* payes well for; and when our *Woodmen* light upon it, they may make what mony they will of it: But to bring it to that curious lustre, so as 'tis hardly to be distinguished from the most curiously diaper'd *Olive*, they *Varnish* their *Work* with the *China-varnish* (hereafter described) which infinitely excells *Lynseed-oyl*, that *Cardan* so commends, speaking of this *Root*.

4. The use of *Ash* is (next to that of the *Oak* it self) one of the most universal: It serves the *Souldier* ——— & *Fraxinus utilis hastis*. *Ovid*. The *Carpenter*, *Wheel-wright*, *Cart-wright*, for *Ploughs*, *Axel trees*, *Wheelrings*, *Harrows*, *Bulls*, *Oares*, the best blocks for *Pullys* and *Sheffs*, as *Seamen* name them; Also for the *Cooper*, *Turner*, and *Thatcher*: Nothing like it for our *Garden Palisad-hedges*, *Hop-yards*, *Poles*, and *Spars*, *Handles*, *Stocks* for *Tools*, *Spade-trees*, &c. In sum, the *Husbandman* cannot be without the *Ash* for his *Carts*, *Ladders*, and other tackling: From the *Pike*, to the *Plow*; *Spear*, and *Bow*, for of *Ash* were they formerly made, and therefore reckon'd amongst those *woods*, which after long tension has a natural *Spring*, and recovers its position; so as in *Peace* and *War* it is a *Wood* in highest request: There is extracted an *Oyl* from the *Ash*, by the proceſſe on other *Woods*, which is excellent to recover the *Hearing*; some drops of it being distill'd warm into the *Ears*; and for the *Caries* or rot of the *Bones*, *Tooth-ach*, pains in the *Kidneys*, and *Spleen*, the anointing therewith is most soveraign. Lastly, the *white*, and rotten dottard part composes a *ground* for our *Gallants Sweet-powder*, and the *Truncheons* make the third sort of the most durable *Coal*, and is (of all other) the sweetest of our *Forest-fuelling*, and the fittest for *Ladies Chambers*: To conclude, the very dead leaves afford (like those of the *Elm*) relief to our *Cattel* in *Winter*; and there is a *dwarfe* sort in *France* (it in truth it be not, as I suspect, our *Witchen-tree*) whose *Berries* feed the poor *People*, in *scarce* years, but it bears no *Keys*, like to ours, which being pickled tender, afford a delicate *Salading*. But the *Shade* of the *Ash* is not to be endur'd, because it produces a noxious *Insect*; and for displaying themselves so very late, and falling very early, not to be planted for *Umbrage*, or *Ornament*; especially neer the *Garden*, since (besides their predatitious *Roots*) the deciduous leaves descending with so long a *Stalk*, are drawn by clusters into the *Worm holes*, which foul the *Allies* with their falling *Keys*, and suddenly infect the *ground*. Note, that the *Season* for felling of this *Tree* must be when the *Sap* is fully at rest; for if you cut it down too early, or over late in the year, it will be so obnoxious

noxious to the *Worm*, as greatly to prejudice the *timber*; therefore to be sure, *fell* not till the three *Mid-winter* Months, beginning about *November*. I am astonish'd at the universal Confidence of all our *Botanists*, that a *Serpent* will rather creep into the *Fire*, than over a twig of *Ash*; this is an old *Imposition* of *Plinys*, who either took it up upon trust, or we mistake the *Tree*.

CHAP. VII.

Of the Chestnut.

1. **T**He next is the *Chestnut*, [*Castanea*] of which *Pliny* re-Chest-nut,
cords many kinds, especially about *Tarentum* and *Naples*; but we commend those of *Portugal* or *Bayone*, choosing the largest brown and most ponderous for *fruit*, such as *Pliny* calls *Coccinea*, but the lesser ones to raise for *Timber*. They are produc'd best by *sowing*; previous to which, let the *Nuts* be first spread to sweat, then cover them in *sand*, a Month being past, plunge them in *Water*, reject the *swimmers*; being dry'd for thirty dayes more, *sand* them again, and to the *water-ordeal* as before. Being thus treated till the beginning of *Spring*, or in *November*, set them as you would do *Beans*; and as some practise it, drench'd for a *night* or more, in new *Milk*: They should be put into the *holes* with the poynt upmost as you plant *Tulips*; *Pliny* will tell you they come not up, unless four, or five be pil'd together in a hole; but that is false, if they be good, as you may presume all those to be which passe this *examination*; nor will any of them fail: But being come up they thrive best *unremoved*, making a great *stand* for at least two years, upon every *transplanting*; yet if needs you must alter their *station*, let it be done about *November*, and that into a light friable ground, or moist *Gravel*, however, they will grow even in *Clay*, *Sand*, and all mixed Soils, upon exposed, and bleak places, and the pendent declivities of *Hills* to the *North*, in dry airy places, and sometimes neer *Marshes* and *Waters*; but they affect no other *compost*, save what their own *leaves* afford them, and are more patient of *cold* than *heat*.

2. If you desire to set them in *Winter*, or *Autumn*, I counsel you to inter them within their *Husks*, which being every way arm'd are a good protection against the *Mouſe*, and a providential integument. *Pliny* l. 15. c. 23. from this natural Guard, concludes them to be excellent *food*, and doubtless *Cæsar* thought so, when he transported them from *Sardis* first into *Italy*, whence they were propagated into *France*, and thence among us; another encouragement to make such *Experiments* out of *forain* Countreys. Some
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sow them confusedly in the *Furrow* like the *Acorn*, and govern them as the *Oak*; but then would the ground be broken up 'twixt *November* and *February*; and when they spring, be cleansed at two foot asunder, after two years growth: Likewise may *Copfes* of *Chestnuts* be wonderfully increased, and thickned, by *laying* the tender and young branches; but such as spring from the *Nuts* and *Marrons* are best of all, and will thrive exceedingly, if being let stand without removing, the ground be stirr'd and loosned about their *Roots*, for two or three of the first years, and the superfluous wood prun'd away; and indeed for good *Trees*, they should be shrip'd up after the first years removal: Thus will you have a *Copse* ready for a *felling*, within eight years, which (besides many other uses) will yield you incomparable *Poles* for any work of the *Garden*, *Vineyard*, or *Hopyard*, till the next *cutting*: And if the *Tree* like the ground, will in ten or twelve years grow to a kind of *Timber*, and bear plentiful fruit.

3. I have seen many *Chestnut-trees* transplanted as big as my arm, their *heads* cut off at five and six foot height; but they came on at leisure: In such *Plantations*, and all others for *Avenues*; you may set them from thirty, to ten foot distance, though they will grow much neerer, and shoot into *Poles*, if (being tender) you cultivate them like the *Asb*, the nature of whose *shade* it resembles, since nothing affects much to grow under it: Some *Husbands* tell me, that the young *Chestnut-trees* should not be pruned or touched with any *knife* or *edgetool*, for the first three or four years, but rather crop'd or broken off, which I leave to farther Experience.

4. The *Chestnut* being grafted in the *Wall-nut*, *Oak*, or *Beech* (I have been told) will come exceeding fair, and produce incomparable Fruit; for the *Wall-nut*, and *Chestnut* in each other, it is probable; but I have not as yet made a full attempt; they also speak of *Inoculating Cherrys* in the *Chestnut*-stock for a *later fruit*. In the mean time, I wish we did more universally propagate the *Horse-Chestnut*, which being easily increas'd from layers, grows into a goodly *Standard*, and bears a most glorious flower, even in our cold Countrey: This *Tree* is now all the *mode* for the *Avenues* to their Countrey Palaces in *France*, as appears by the late *Superintendents* Plantation at *Vaux*. It was first brought from *Constantinople* to *Vienna*, thence into *Italy*, and so *France*; but to *Us* from the *Levant* more immediately, and flourishes so well, and grows so goodly a *Tree* in compent time, that by *this* alone, we might have ample encouragement to Denizen other *strangers* amongst us.

5. The *Chestnut* is (next the *Oak*) one of the most sought after by the *Carpenter* and *Joyner*: It hath formerly built a good part of our ancient Houses in the *City* of *London*, as does yet appear. I had once a very large *Barn* neer the *City* fram'd intirely of this *Timber*: And certainly they grew not far off; probably in some *Woods* neer the *Town*: For in that description of *London*

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written by *Fitz-Stephens*, in the Reign of *Hen. 2.* he speaks of a very noble and large *Forest* which grew on the *Boreal* part of it : *Proxime* (sayes he) *patet foresta ingens, saltus nemorosi ferarum, latetbra cervorum, damarum, aprorum, & taurorum Sylvestrium, &c.* A very goodly thing it seems, and as well stor'd with all sorts of good *Timber*, as with *Venison* and all kind of *Chase*. The *Chestnut* affords the best *Stakes* and *Poles* for *Palisades*, *Pedaments* for *Vine-props*, and *Hops*, as I said before : Also for *Mill-timber* and *Water-works*, or when it may lie buried ; but if *water* touch the *Roots* of the growing *Trees*, it spoils both *Fruit* and *Timber* : 'Tis likewise observed, that this *Tree* is so prevalent against *cold*, that where they stand, they defend other *Plantations* from the injuries of the severest *frosts* : I am sure being planted in *Hedge-rows*, & circa *agrorum itinera*, or for *Avenues* to our *Countrie-houses*, they are a magnificent, and royal *Ornament* : This *Timber* also does well for *Columns*, *Tables*, *Chests*, *Chairs*, *Stools*, *Bedsteads* ; for *Tubs*, and *Vine-Cask*, which it preserves with the least tincture of the *wood* of any whatsoever : If the *Timber* be dip'd in *scalding Oyl*, and well *Pitch'd*, it becomes extreamly durable : *Beams* made of *Chestnut tree* have this property, that being somewhat brittle, they give warning, and premonish the danger by a certain crackling which it makes : Formerly they made *Consultatory Staves* of this *Tree* ; and the *Variegated Rods* which *Jacob* peel'd to lay in the *Troughs*, and impresse a fancy in his *Father-in-law's* conceiving *Ewes*, were of this material. The *Coales* are excellent for the *Smith*, being soon kindled, and as soon extinguish'd ; but the *Ashes* of *Chestnut wood* are not convenient for to make a *Lee* with, because it is observ'd to stain the *Linnen*. As for the *Fruit*, 'tis better to beat it down from the *Tree*, some little time before they fall off themselves ; thus, they will the better keep, or else you must smoke-dry them. But we give that fruit to our *Swine* in *England*, which is amongst the delicacies of *Princes* in other *Countries* ; and being of the larger *Nut*, is a lusty, and masculine food for *Rustics* at all times ; and of better nourishment for *Husbandmen* than *Cole* and *rusty Bacon*, yea, or *Beans* to boote, instead of which, they boyle them in *Italy* with their *Bacon* ; and in *Virgil's* time, they ate them with *Milk* and *Cheese*. The best *Tables* in *France* and *Italy* make them a *Service*, eating them with *Salt*, in *Vine*, or juice of *Lemon* and *Sugar* ; being first roasted in *Embers* on the *Chaplet* ; and doubtlesse we might propagate their use, amongst our *common people*, (as of old the *Βαλανιόφυτον*) being a food so cheap, and so lasting. In *Italy* they also boyl them in *Wine*, and then smoke them a little, these they call *Anseri* or *Geese*, I know not why : Those of *Piemont* add *Fennel*, *Cinnamon* and *Nutmeg* to their *Wine*, but first they peepe them. Others macerate them in *Rose-water* ; the Bread of the flower is exceeding nutritive ; 'tis a robust food and makes *Women* well complexion'd, as I have read in a good Authour : They also make *Fritters* of *Chestnut flower*, which they wet with *Rosewater*, and sprinkle with
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grated *Parmegiano*, and so fry them in fresh *Butter*, a delicate: How we here use them in stew'd-meats, and *Beauille-Pyes*, our *French Cooks* teach us; and this is in truth the very best use of their Fruit, and very commendable; for it is found that the eating of them *raw* or in Bread (as they do much about *Limosin*) is apt to swell the belly, though without any other inconvenience that I can learn, and yet some condemn them as dangerous for such as are subject to the *Gravel* in the *Kidnies*. The best way to preserve them, is to keep them in Earthen vessels in a cold place; some lay them in a *Smoke-loft*, others, in dry *Barly-straw*, others, in *Sand*, &c. The leaves of the *Chestnut* tree makes very wholesome *Mat-trasses* to lye on, and they are good Litter for *Cattel*: But those leafie beds, for the crackling noyle they make when one turns upon them, the *French* call *Lits de Parliament*: Lastly, the flower of *Chestnuts* made into an *Electuary* with *Hony*, is an approved Remedy against spitting blood, and the *Cough*; and a decoction of the *Rind* of the Tree, tinctures hair of a golden Colour.

CHAP. VIII.

Of the Wall-nut.

Wall-nut.

1. **J**uglans, quasi Jovis glans, the Wall-nut, is of several sorts; the soft shell, and the hard, the whiter, and the blacker grain: This black bears the worst Nut, but the Timber much to be preferred, and we might propagate more of them if we were careful to procure them out of *Virginia*, where they abound, or from *Grenoble*, which our *Cabinet-makers* so prize. It is said that the *Walnut* kernel wrap'd in its own leaf, being carefully taken out of its shell, brings a Nut without shell; but this is a trifle; the best way to elevate them is, to set them as you do the *Chestnut*, being planted of the Nut, or set at the distance you would have him stand; for which they may be prepared by beating them off the Tree (as was prescribed of the *Chestnut*) some dayes before they quit the Branches of themselves, and kept in their husks, or without them, till *Spring*, or by bedding them (being dry) in sand, or good Earth, till *March*, from the time they fell, or were beaten off the Tree: Or if before, they be set with husk and all upon them; for the extream bitterness thereof is most exitial, and deadly to *Worms*; or it were good to strew some *Furzes* (broken or chopp'd small) under the ground amongst them, to preserve them from *Mice* and *Rats*, when their shells begin to wax tender; especially if as some, you supple them a little in warm *Cows milk*; but

but being treated as before, you will find them already *sprouted*, and have need onely to be planted where they are to abide; because (as we said long since) they are most impatient of *transplanting*: But if there be an absolute necessity of removing, let your *Tree* be about four years old, and then by no means touch the *head* with your *Knife*, nor cut away so much as the very *Tap-root*, if you can well dispose of it, since being of a pithy and hollow substance, the least diminution, or bruise, will greatly endanger the killing: But see here what we have said of the *Chestnut*; I have been told, that the very *Tops*, and palish *Buds* of this *Tree*, when it first sprouts, though as late as *April*, will take hold of the ground, and grow to an incredible improvement; but first they steep them in *Milk* and *Saffron*; but this attempt did not succeed with us, yet it will be propagated by a Branch slipp'd off with some of the old wood, and set in *February*: An industrious and very experienc'd *Husbandman* told me, that if they be *transplanted* as big as ones *Middle*, it may be done safer than when younger; I do onely report it: What they hint of putting a *Tile-shard* under the *Nuts* when first set, to divaricate and spread the *Roots* (which are otherwise apt to penetrate very deep) I like well enough; 'tis said they will receive their own *Cyons* being *Grafted*, but that it does not at all improve their *Fruit*: The best compost is the strewing of *Ashes* at the foot of the *Trees*, the *Salt* whereof being washed into the *Earth*, is the best dressing, whilst the juice of the fallen *leaves*, though it kill the *Worm*, is noxious to the *Root*.

2. The *Walnut* delights in a dry, sound, and rich land; especially if it incline to a feeding *Chalk*, or *Marle*; and where it may be protected from the cold (though it affect cold rather than extream heat) as in great Pits, Vallies, and Highway sides; also in Stonie-grounds, and on Hills, especially *Chalkie*: likewise in *Cornfields*: Thus *Burgundy* abounds with them, where they stand in the midst of goodly *Wheat-lands*, at sixty, and an hundred foot distance; and it is so far from hurting the *crop*, that they look on them as a great Preserver, by keeping the grounds warm; nor do the roots hinder the *Plow*. When ever they fell a *Tree* (which is onely the old, and decayed) they alwayes plant a young one near him; and in several places 'twixt *Hanaw*, and *Francfort* in *Germany*, no young *Farmer* whatsoever is permitted to *Marry* a *Wife*, till he bring proof that he hath planted, and is a Father of such a stated number of *Walnut-trees*, as the Law is inviolably observed to this day, for the extraordinary benefit which this *Tree* affords the *Inhabitants*: And in truth, were this *Timber* in greater plenty amongst us, we should have far better *Ustensils* of all sorts for our Houses, as *Chairs*, *Stools*, *Bedsteads*, *Tables*, *Wainscot*, *Cabinets*, &c. in stead of the more vulgar *Beech*, subject to the *worm*, weak, and unsightly; but which to counterfeit and deceive the unwary, they wash over with a decoction made of the *Green husks* of *Walnuts*, &c. I say, had we store of this material, we should

find an incredible improvement in the more stable Furniture of our Houses, as in the first *frugal*, and better days of *Rome*, when

Tables made here at home, those times beheld,
Of our own Wood, for that same purpose sell'd,
Old Walnut blown down, when the Wind set East.

Sr. R. Stapleton.

*illa dominatas, nostraque ex arbore mensas
Tempora viderunt : hoc lignum stabat in usus,
Annosam si fortè nucem dejecerat Eurus.*

JUV. l. 4. Sat. 11.

for if it had been cut in that season, it would not have prov'd so found, as we shew in our *Chapter of Felling*. It is certain, that the *Mensa nucina*, were once in price even before the *Citrin*, as *Strabo* notes; and nothing can be more beautiful, than some Planks, and Works which I have beheld of it, especially that which comes from *Grenoble*, of all other the most beautiful and esteem'd.

3. They render most graceful *Avenues* to our Country dwellings, and do excellently neer *Hedge-rows*; but had need be planted at forty, or fifty foot interval, for they affect to spread both their Roots and Branches. The *Bergstras* (which extends from *Heidelberg* to *Darmstadt*) is all planted with *Walnuts*; for so by another antient Law, the *Bordurers* were obliged to nurse up, and take care of them; and that chiefly, for their ornament and shade; so as a man may ride for many miles about that Countrey, under a continued *Arbour*, or *Close-walk*; The Traveller both refresh'd with the *Fruit*, and the *shade*, which some have causlessly defam'd for its ill effects on the *head*, for which the *Fruit* is a *specificque* and a notable *signature*; although I deny not, but the sent of the fallen leaves, when they begin to be damp'd with lying, may emit somewhat a heady *steam*, which to some has prov'd noxious; but not whilst they were fresh, and lively upon the Trees. How would such publick *Plantations* improve the Glory and Wealth of a Nation! but where shall we find the *spirits* among our Countrymen? Yes, I will adventure to instance in those *Plantations* of Sir *Richard Stidolph*, upon the *Downs* neer *Lether-head* in *Surry*; and so about *Cassaulton*, where many thousands of these *Trees* do celebrate the *industry* of the *Owners*; and will certainly reward it with infinite *improvement*, as I am assur'd they do in part already, and that very considerably; besides the *Ornament* which they afford to those pleasant *traçts*, for some *Miles* in circumference. I remember *Monsieur Sorbiere*, in a *Sceptical* discourse to *Monsieur de Martel*, speaking of the readinesse of the People in *Holland* to furnish and maintain whatsoever may conduce to the publick *Ornament*, as well as convenience; tells us, that their *Plantations* of these, and the like *Trees*, even in their very *Roads*, and common *High-ways*, are better preserv'd, and entertain'd (as I my self have likewise been often an eye-witness) then those about the *Houses*, and *Gardens of pleasure* belonging to the *Nobles* and *Gentry* of most other *Countries*: And in effect it is a most ravishing object, to behold their amenities in this particular: With us sayeshe (speaking of *France*) they make a jest at such political *Ordinances*, by
ruining

ruining these publick and useful Ornaments, if haply some more prudent *Magistrate*, do at any time introduce them. Thus in the Reign of *Henry the fourth*, during the *Superintendency* of *Monsieur de Sully*, there was resolution of adorning all the *High-ways* of *France* with *Elms*, &c. but the rude and mischievous *Paysans*, did so hack, steal, and destroy what they had begun, that they were forced to desist from the thorough prosecution of the design; so as there is nothing more expos'd, wild, and lesse pleasant then the Common *Roads* of *France* for want of shade, and the decent *limits* which these sweet, and divertissant *Plantations* would have afforded; not to omit that *Political* use, as my Lord *Bacon* hints it, where he speaks of the *Statues* and *Monuments* of brave men, and such as had well deserv'd of the *Publick*, erected by the *Romans* even in their *High-ways*, since doubtlesse, such noble, and agreeable objects, would exceedingly divert, entertain, and take off the *Minds* and *Discourses* of *Melancholy* people, and pensive *Travellers*, who having nothing but the dull and enclosed *Wayes* to cast their eyes on, are but ill *Conversation* to themselves, and others, and in stead of Celebrating, Censure their Superiours. It is by a curious *Person*, and industrious *Friend* of mine, observ'd, that the *Sap* of this *Tree* rises, and descends with the *Suns* diurnal course (which it visibly slackens in the *Night*) and more plentifully at the *Root* on the *South-side*, though those on the *North* were larger, and lesse distant from the *Body* of the *Tree*; and not onely distill'd from the ends, which were next the *Stem*, but from those which were cut off and separated; which was never observed to happen in the *Birch*, or other *Sap-yielding Trees*.

4. What universal use the *French* make of the *Timber* of this sole *Tree*, for domestic affairs, may be seen in every *Room* both of *Poor* and *Rich*: It is of singular account with the *Joyner*, for the best grain'd and colour'd *Wainscot*, with the *Gunsmith* for *Stocks*, for *Coach wheels* excellent, and the *Bodies* of *Coaches*, the *Drum-maker* for *Rimbs*, the *Cabinet-maker* for *Inlayings*, especially the firm and close *Timber* about the *Roots*, which is admirable for *fleck'd* and *chambletted* works, some wood especially, as that which we have from *Bologne* very black of Colour, and so admirably streaked, as to represent natural *flowers*, *Landskips*, and other *Fancys*: To render this the better coloured, *Joyners* put the boards into an *Oven* after the *batch is forth*, or lay them in a warm *Stable*, and when they work it, polish it over with its own *Oyl* very hot, which makes it look black and sleek, and the older it is the more esteemable; but then it should not be put in work till thoroughly seasoned, because it will shrink beyond expectation. It is only not good to confide in it much for *beams*, or *Joysts*, because of its brittleness; of which yet, it has been observed to give timely notice, by the crackling before it breaks. Besides the uses of the *Wood*, the *fruit* with *husk* and all when tender and very young, is for *preserves*, for *food*, and *Oyl*, of extraordinary use with the *Painter*, in *whites*, and other delicate Colours; also for *Gold-size*, and *Vernish*; and

with this they polish *Walking-staves*, and other works which are wrought in with burning : For *Food* they Fry with it in some places, and use it to burn in *Lamps*; the younger *Timber* is held to make the better coloured work (and so the *Oak*) but the older more firm and close, is finer *Chambleted* for Ornament; and the very husks and leaves being macerated in warm Water, and that Liquor poured on the *Carpet* of *Walks*, and *Bowling-greens*, does infallibly kill the *Worms* without endangering the grass; not to mention the *Dye* which is made of this *Lixive*, to Colour *Wooll*, *Woods*, and *Hair*, as of old they us'd it. The water of the *Husks* is soveraign against all pestilential infections, and that of the *leaves* to mundifie, and heal inveterate *Ulcers*. That which is produc'd of the *thick-shell*, becomes best *Timber*, that of the *thinner* better *Fruit*. *Columella* has sundry excellent Rules how to ascertain, and accelerate the *growth* of this *Tree*, and to improve its *qualities*, and I am assur'd, that having been *Grafted* on the *Ash* (though others say no *Infstion* improves it) they thrive exceedingly, become handsome *Trees*, and what is most estimable, bears its *fruit* within four years; all which I recommend to the farther Industrious. The green *husk* dry'd, or the first peeping red *Buds* and *leaves* reduc'd to *powder*, serves instead of *Pepper*, to condite *meats* and *saucers*. 'Tis better to cudgel off the *Fruit*, than to gather it by hand; and in *Italy* they arm the tops of long *Poles* with nails and iron for the purpose, and believe the *beating* improves the *Tree*: Those *Nuts* which come not easily out of their *husks*, should be laid to mellow, in heaps, and the rest expos'd in the *Sun*, till the *Shells* dry, else they will be apt to perish the *Kernel*: Some again preserve them in their own *leaves*, or in a *Chest* made of *Walnut-tree* wood; others in *Sand*: Old *Nuts* are not wholesome till macerated in warm and almost boiling water; but if you lay them in a *Leaden* pot, and bury them in the *Earth*, so as no *Vermine* can attaque them, they will keep mervellously plump the whole year about, and may easily be blanch'd: In *Spain* they use to strew the gratings of old and hard *Nuts* (first peeld) into their *Tarts* and other *Meats*. For the *Oyl*, one *Bushel* of *Nuts* will yield fifteen pounds of peeld and cleer *Kernels*, and that half as much *Oyl*, which the sooner 'tis drawn, is the more in *quantity*, though the dryer the *Nut* the better in *quality*; the *Lees*, or *Marc* of the Pressing, is excellent to fatten *Hogs* with. After the *Nuts* are beaten down, the *leaves* would be swep'd into heaps, and carried away, because their extream Bitterness impairs the ground, and as I am assur'd, prejudices the *Trees*: The Green *husks* boyled, make a good *Colour* to dye a dark *Tellow*, without any mixture; and the distillation of its *leaves* with *Hony* and *Urine*, makes *Hair* spring in bald-heads: Besides its use in the Famous *Salernitan Antidote*; if the *Kernel* a little masticated, be applied to the biting of a suspected *Mad-dog*, and when it has lain three hours, be cast to *Poultry*, they will dye it they eat of it. In *Italy*, when a Countrey man finds any pain in his *Side*, he drinks a Pint of the
fresh

fresh Oyl of this Nut, and finds immediate ease : The Kernel being rub'd upon any crack or chink of a Leaking or crasy Vessel, stops it better than either Clay, Pitch, or Wax : In France they eat them blanch'd and fresh with Wine and Salt, having first cut them out of the shells before they are hardned, with a short broad brasse-knife, because Iron rusts, and these they call *Cernois*, from their manner of scooping them out.

CHAP. IX.

Of the Mulberry.

1. **M**orus, the *Mulberry* : It may possibly be wonder'd by *Mulberry*. some, why we should insert this Tree amongst our Forest Inhabitants ; but we shall soon reconcile our industrious Planter, when he comes to understand the incomparable benefit of it, and that for its Timber, durableness, and use for the Joyner and Carpenter, and to make Hoops, Bows, Wheels, and even Ribs for small Vessels in stead of Oak, &c. though the Fruit and the leaves had not the due value with us, which they deservedly enjoy in other places of the World.

2. But it is not here I would recommend our ordinary black-fruit bearers, though that be likewise worth the propagation ; but that kind which is call'd the *White Mulberry*, one of them of a broad leaf, found in Province, whose Seeds being procured from Paris, where they have it from *Avignon*, should be thus treated in the Seminary.

3. In Countreys where they cultivate them for the *Silk worm*, and other uses, they sow the perfectly mature berrys of a Tree whose Leaves have not been gather'd ; these they shake down upon an old Sheet, spread under the Tree, to protect them from Gravel and Ordure, which will hinder you from discerning the Seed : If they be not ripe, lay them to mature upon Shelves, but by no means till they corrupt ; to prevent which, turn them daily ; then put them in a fine Sieve, and plunging it in Water, bruise them with your hand ; do this in several Waters, then change them in other clear Water, and the Seed will sink to the bottom, whilst the pulp swims, and must be taken off carefully : This done, lay them to dry in the Sun upon a linnen Cloth, for which, one hour is sufficient, then Van and sieft it from the husks, and reserve it till the season. This is the proceſſe of curious persons, but the sowing of ripe *Mulberries* themselves is altogether as good, and from the excrement of Hogs, and even Dogs (that will frequently eat them) they will rise abundantly : Note, that in sowing the Berry 'tis good

good to squash and bruise them with fine sieved Mould, and if it be rich, and of the old bed, so much the better: They would be interr'd, well moistned and cover'd with *straw*, and then rarely water'd till they peep; Or you may squeeze the ripe *Berrys* in Ropes of *Hair* or *Bast*, and bury them as is prescrib'd for *Hippis* and *Haws*; the *Earth* in which you sow them, should be fine *Mould*, and as rich as for *Melons*, rais'd a little higher then the *Area*, as they make the Beds for ordinary *Pot-herbs*, to keep them loose and warm, and in such *beds* you may sow *Seeds* as you do *Purslane*, mingled with some fine *Earth*, and thinly cover'd, and then for a fortnight strew'd over with *straw*, to protect them both from sudden *heat*, and from *birds*: The Season is *April* or *May*, though some forbear even till *July* and *August*, and in the second quarter of the *Moon*, the Weather calm and serene; at the beginning, keep them moderately fresh (not over wet) and clean weeded, secured from the rigor of *Frosts*; the second year of their growth about the beginning of *October*, or early *Spring*, draw them gently out, prune the *Roots*, and dipping them a little in *Pond-water*, transplant them in a warm place or *Nursery*; 'tis best ranging them in *Drills*, two foot large, and one in depth, each rill three foot distance, and each Plant two. And if thus the new *Earth* be somewhat lower then the Surface of the rest, 'twill the better receive the *Rain*: Being Planted, cut them all within three *Inches* of the ground. Water them not in *Winter*, but in extreame necessity, and when the weather is warm, and then do it in the Morning. In this cold Season you shall do well to cover the ground with the Leaves of *Trees*, *straw*, or short *Littier*, to keep them warm; and every year you shall give them three *Dressings* or half diggings; viz. in *April*, *June*, and in *August*; this, for the first year, still after *Rain*: The second *Spring* after *Transplanting*, purge them of all superfluous *shoots* and *Scions*, reserving only the most towardly for the future *Stem*; this to be done yearly, as long as they continue in the *Nursery*; and if of the principal *Stem* so left, the *frost* mortifie any part, cut it off, and continue this government till they are neer six foot high, after which suffer them to spread into *head* by discreetly pruning, and fashioning them: But if you plant where *Cattel* may endanger them, the *stem* had need be taller, for they are extreemly liquorish of the leaves.

4. When now they are about five years growth, you may transplant them without cutting the *Root* (provided you irradicate them with care) onely trimming the *head* a little; the Season is from *September* to *November* in the *New Moon*, and if the holes or pits you set them in were dug and prepar'd some months before, it would much secure their taking; some cast *hornes*, *bones*, *Shells*, &c. into them the better to loosen the earth about them, which should be rich, and well refresh'd all *Summer*. A light, and dry *Mould* is best, well expos'd to the *Sun* and *Air*, which above all things this *Tree* affects, and hates *watery* low grounds: In sum, they thrive best where *Vines* prosper most, whose society they exceedingly cherish;

cherish; nor do they less delight to be amongst *Corn*, no way prejudicing it with its shade. The *Distance* for these *Standards* would be twenty, or twenty four foot every way, if you would design *Walks* or *Groves* of them; if the environs of *Fields*, *Banks* of *Rivers*, *High-ways*, &c. twelve or fourteen foot may suffice, but the farther distant, the better.

5. Another Expedient to increase *Mulberries* is, by *Layers* from the *Suckers* at the foot, this done in *Spring*, leaving not above two *Buds* out of the Earth, which you must diligently *water*, and the second year they will be rooted: They will also take by passing any branch or Arm slit, and kept a little open with a wedge, or stone, through a basket of *Earth*, which is a very sure way: Nay, the very *Cuttings* will strike in *Spring*, but let them be from *Shoots* of two years growth, with some of the old Wood, though of seven or eight years; these set in *Rills* like *Vines*, having two or three *Buds* at the top, will root infallibly, especially if you *twist* the old Wood a little, or at least *back* it, though some slit the foot, inserting a stone, or grain of an *Oate*, to suckle and entertain the *Plant* with moisture.

6. They may also be propagated by *Grafting* them on the *black Mulberry* in *Spring*, or *inoculated* in *July*, taking the *cyons* from some old tree, that has broad, even, and round leaves, which causes it to produce very ample and tender leaves, of great emolument to the *Silk-master*.

7. Some experienc'd *Husbandmen* advise to poll our *Mulberries* every three or four years, as we do our *Willows*: others not till 8 years: both erroneously. The best way is yearly to prune them of their dry and superfluous branches, and to form their heads round and natural. The first year of *removal* where they are to abide, cut off all the *shoots* to five or six of the most promising: the next year leave not above three of these, which dispose in *triangle* as near as may be, and then disturb them no more, unless it be to *purge* them (as we taught) of dead *scare-wood*, and extravagant parts, which may impeach the rest; and if afterward any prun'd branch shoot above three or four *Cyons*, reduce them to that number. One of the best ways of *Pruning* is, what they practise in *Sicily* and *Province*, to make the head hollow and like a *bell*, by cleansing them of their inmost branches; and this may be done, either before they bud, *viz.* in the *New Moon of March*, or when they are full of leaves in *June* or *July*, if the season prove any thing fresh. Here I must not omit what I read of the *Chinese* culture, and which they now also imitate in *Virginia*, where they have found a way to raise these *Plants* of the *Seeds*, which they mow and cut like a *crop of grass* which sprout and bear leaves again in a few months.

8. The *Mulberry* is much improv'd by stirring the Mould at root, and Lestulion.

9. We have already mentioned some of the *Uses* of this excellent tree, especially of the *white*, so called because the fruit is of a paler colour, which is also of a more luscious taste, and lesser than the

the *black* ; The *rind* likewise is whiter, and the *leaves* of a mealy clear green colour, and far tenderer, and sooner produc'd by at least a fortnight, which is a marvellous advantage to the newly disclos'd *Silk-worm* ; Also they arrive sooner to their maturity, and the food produces a finer *web*. Nor is this *tree* less beautiful to the eye than the fairest *Elm*, very proper for *Walks* and *Avenues* : The *timber* (amongst other properties) will last in the *water* as well as the most solid *Oak*, and the bark makes good and tough *Bast-ropes*. It suffers no kind of *Vermin* to breed on it, whether standing or fell'd, nor dares any *Caterpillar* attack it save the *Silk-worm* only. The *Loppings* are excellent *fuel* : but that for which this *tree* is in greatest and most worthy esteem, is for the *Leaves*, which (besides the *Silk-worm*) nourishes *Cows*, *Sheep*, and other *cattel* ; especially young *Porkers*, being boil'd with a little *bran* : and the *fruit* excellent to feed *Poultry*. In summe, what ever eats of them, will with difficulty be reduc'd to endure any thing else, as long as they can come by them ; to say nothing of their other sovereign qualities, as *relaxing* of the *belly* being eaten in the morning, and curing *Inflammations* and *Ulcers* of the *mouth* and *throat*, mix'd with *Mel Rosarum*, in which *Receipt* they do best, being taken before they are over-ripe.

10. To proceed with the *Leaf* (for which they are chiefly cherish'd) the benefit of it is so great, that they are frequently *let to farm* for vast summes ; so as some one sole *tree* has yielded the *proprietor* a rent of twenty *Shillings per Annum*, for the *Leaves* onely ; and six or seven pounds of *Silk*, worth as many pounds *Sterling*, in five or six weeks, to those who keep the *worms*. We know that till after *Italy* had made *Silk* above a *thousand* years, they receiv'd it not in *France* ; it being hardly yet an *hundred* since they betook themselves to this *manufacture* in *Province*, *Languedoc*, *Dauphine*, *Lionnois*, &c. and not in *Tourain* and *Orleans* till *Hen.* the fourth's time ; but it is incredible what a *Revenue* it amounts to in that *Kingdom*. About the same time, or a little after, it was that *King James* did with extraordinary care recommend it to this *Nation*, by a *Book of Directions*, *Acts of Council*, and all other Princely assistance. But this did not take no more then that of *Hen.* the fourth's *Proposal* about the *Inviron*s of *Paris*, who fill'd the *High-ways*, *Parks*, and *Gardens* of *France* with the trees, beginning in his own *Gardens* for encouragement : Yet, I say, this would not be brought into example, till this present great *Monarch*, by the indefatigable diligence of *Monsieur Colbert* (*Superintendent of His Majesties manufactures*) who has so successfully reviv'd it, that 'tis prodigious to consider what an happy progress they have made in it, to our shame be it spoken ; who have no other discouragements from any insuperable difficulty whatever, but our *sloth* and want of *industry* : since where ever these *trees* will grow and prosper, the *Silk-worms* will do so also ; and they were alike averse, and from the very same suggestions where now that *manufacture* flourishes in our *neighbour* Countries. It is demonstrable, that *Mulberries* in four or five years may be made to spread

spread all over this *Land*, and when the indigent and young *dangh-
ters* in proud Families are as willing to gain three or four Shillings a
day for gathering *Silk*, and busying themselves in this sweet and
easie *employment*, as some do to get *four pence* a day for hard work at
Hemp, *Flax*, and *Wool*; the reputation of *Mulberries* would spread
in *England* and other Plantations. I might say something like this
of *Saffron*, which we yet too much neglect the *culture* of; but,
which for all this I do not despair of seeing reassum'd when that
good *Genius* returns. In order to this hopeful *Prognostick* we will add
a few Directions about the gathering of their *Leaves*, to render this
chapter one of the most accomplish'd; for certainly one of the most
accomplish'd and agreeable *works* in the world.

11. The *Leaves* of the *Mulberry* should be collected from *trees* of
seven or eight years old; if of such as are very *young*, it impairs
their growth, neither are they so healthful for the *worms*, making
them *hydropical* and apt to burst: As do also the *Leaves* of such *trees*
as be planted in a too *waterish* or over-rich *soil*, or where no *Sun*
comes; and all sick and *yellow* leaves are hurtful. It is better to
clip, and let the *leaves* fall upon a subtended *sheet* or *blanket*, than
to gather them by hand; and to *gather* them, than to *strip* them,
which marris and gauls the *branches*, and bruises the *leaves* that
should hardly be touched. Some there are who lop off the *boughs*,
and make it their *pruning*, and it is a tolerable way, so it be dif-
creetly done in the over-thick parts of the *tree*; but these leaves
gather'd from a separated branch will die, and wither much soon-
er than those which are taken from the *tree* immediately, unless you
set the *stem* in water. *Leaves* gathered from boughs cut off will
shrink in three hours; whereas those you take from the living *tree*
will last as many days; and being thus a while kept are better than
over-fresh ones. It is a *Rule*, Never to gather in a *rainy* season, nor
cut any *branch* whilst the *wet* is upon it; and therefore against such
suspected times you are to provide before hand, and to reserve
them in some fresh but dry place: the same *caution* you must ob-
serve for the *dew*, though it do not rain, for *wet-food* kills the
worms. But if this cannot be altogether prevented, put the *leaves*
between a pair of *sheets* well dried by the *fire*, and shake them up
and down till the moisture be drunk up in the *Linen*, and then
spreading them to the air a little, on another dry cloth, you may feed
with them boldly. The top-leaves and oldest would be gathered
last of all, as being most proper to repast the *worms* with towards
their last change. The *gatherer* must be neat, and have his hands
clean, and his *breath* sweet, and not poison'd with *Onions* or *Tobac-
co*, and be careful not to press the leaves by crouding them into the
Bags or Baskets. Lastly, that they *gather* onely (unless in case of
necessity) leaves from the *present*, not from the former years sprigs,
or old *wood*, which are not onely rude and harsh, but are annex'd
to stubb'd Stalks, which injure the *worms*, and spoil the denudated
branches.

12. This is what I thought fit to premonish concerning the ga-

thering of the Leaves of this tree for *Silk-worms*, as I newly find it in *Monsieur Isnard's Instructions*, in that exact Discourse of his published some three years since, and dedicated to *Monsieur Colbert*, who has, it seems, constituted this industrious and experienc'd person, Surveyor of this Princely manufacture about *Paris*; and because the book it self is rare, and known of by very few. I have no more to adde, but this for our encouragement, and to encounter the *Objections* which may be suggested about the coldness and moisture of our Country; That the *Spring* is in *Province* no less inconstant than is ours in *England*; that the *colds* at *Paris* are altogether as sharp; and that when in *May* it has continued raining for nine and twenty days successively, *Monsieur Isnard* assures us, he proceeded in his work without the least disaster; and in the year 1664 he presented the *French King* his Master with a considerable quantity of better *Silk*, than any *Messina* or *Boulonia* could produce, which he sold raw at *Lions*, for a *Pistol* the pound; when that of *Avignon*, *Province*, and *Dauphine* produc'd little above half that price. But you are to expect the compleat History of the *Silk-worm* from that incomparable Treatise, which the learned *Malpighius* has lately sent out of *Italy*, and dedicated to the *Royal Society* (now ready to be publish'd) as a specimen, and noble effect of its universal correspondence and concerns for the improvement of useful knowledge.

CHAP. X.

Of the Service.

Service.

1. *Sorbus*, the *Service tree* (of which there are four sorts) is rais'd of the *Chequers* or *Berries*, which being ripe (that is) rotten, about *September*, may be sown like *Beech-Mast*: It is reported that the *Sower* never sees the fruit of his labour; either for that it bears only being very old, or that Men are commonly so, before they think of planting *Trees*: But this is an egregious mistake; for these come very soon to be *Trees*, and being planted young, thrive exceedingly; I have likewise planted them as big as my arm successfully: The best way is therefore to propagate them of *Suckers* or *Sets*; they delight in reasonable good ground, rather inclining to cold, then over hot; for in places which are too dry, they never bear kindly. The *Terminalis* is the kind most frequent with us; for those of the narrower and lesse indented *Leaf*, is not so common in *England* as in *France*, bearing a sort of *Berry* of the *Pear* shape, and is there call'd the *Cormier*; this *Tree* may be *Grafted* either with it self, or on the *White-thorn*, and *Quince*.

2. The

2. The *Timber* is useful for the *Joyner*, for the *Engraver* of *Woodcuts*, *Bows*, *Pulleys*, *Skrews*, *Mill-Spindles* and other *Goads* to drive *Oxen* with, &c. *Pistol*, and *Gun-Stocks*, and for most that the *Wild-Pear-tree* serves; and being of a very delicate *Grain*, for the *Turner*, and divers *curiosities*, and looks delicately, and is almost everlasting, being rub'd over with *Oyl* of *Linseed*, well boyl'd, and may be made to counterfeit *Ebony*, or almost any *Indian Wood*, colour'd according to *Art*: Also it is taken to Build with, yielding *Beams* of considerable substance: The shade is beautiful for *Walks*, and the *Fruit* not unpleasant, especially the *second-kind*, of which with new *Wine* and *Honey*, they make a *Condilum* of admirable effect to corroborate the *Stomach*; and the *Fruit* alone is good in *Dysentery* and *Lasks*. The *water* distill'd from the *Stalks* of the *Flowers* and *Leaves* on *M. B.* and twice *Rectified* upon fresh matter, is incomparable for *Consumptive* and *Tabed Bodies*, taking an *Ounce* daily at several times: Likewise it cures the *Green-sickness* in *Virgins*, and is prevalent in all *Fluxes*; distill'd warm into the *Ears* it abates the pain: The *Wood*, or *Bark* contus'd and applied to any green *Wound*, heals it; and the *Powder* thereof drank in *Oyl Olive*, consolidates inward *Ruptures*: Lastly, the *Salt* of the *Wood* taken in decoction of *Althæa* to three *Grains*, is an incomparable Remedy to break and expel *Gravel*. The *Service* gives the *Husbandman* an early presage of the approaching *Spring*, by extending his adorned *Buds* for a peculiar entertainment, and dares peep out in the severest *Winters*.

CHAP. XI.

Of the Maple.

1. **T**He *Maple* [*Acer minus*] (of which *Authors* (see *Salmafius* upon *Solinus*. c. 33.) reckon very many kinds) was of old held in equal estimation almost with the *Citron*; especially the *Bruseum*, the *French-Maple*, and the *Peacocks-tail Maple*, which is that sort so elegantly undulated, and crisped into variety of *curls*. It were a most laudable attempt, if some would enquire out, and try the planting of such sorts as are not *Indigenes* amongst us; such as is especially the *German Aire*, and that of *Virginia*, not yet cultivated here, but an excellent *Tree*: And if this were extended to other *Timber* and *exotic Trees*, likewise it would prove of extraordinary benefit and Ornament to the *Publick*, and were worthy even of the *Royal Care*. They are all produced of the *Keys*, like the *Ash*; and like to it, affect a *sound*, and a *dry, mould*; Maple.

growing both in *Woods* and *Hedge-rows*, especially in the latter; which it rather hilly then low, affords the fairest *Timber*. By shredding up the boughs to a head, I have caused it to shoot to a wonderful height in a little time; but if you would *lop* it for the *fire*, let it be done in *January*. The *timber* is far superiour to *Beech* for all uses of the *Turner*, who seeks it for *Dishes*, *Cups*, *Trays*, *Trenchers*, &c. as the *Joyner* for *Tables*, *Inlayings*, and for the delicateness of the grain, when the *knurs* and *nodosities* are rarely *diapred*, which does much advance its price. Also for the lightness (under the name *Ayer*) imploy'd often by those who make *Musical Instruments*. But there is a larger sort, which we call the *Sycomor*.

2. But the description of this lesser *Maple*, and the ancient value of it, is worth the citing. *Acer operum elegantia & subtilitate Cedro secundum; plura ejus genera: Album, quod precipui candoris vocatur Gallicum: In Transpadana Italia, transque Alpes nascens. Alterum genus crispo macularum discursu, qui cum excellentior fuit, à similitudine caudæ pavonum nomen accepit.* 'The *Maple* (says *Pliny*) for the 'elegancy and fineness of the wood is next to the very *Cedar* it self: 'There are several kinds of it, especially the *White*, which is wonderfully beautiful; this is call'd the *French Maple*, and grows on 'that part of *Italy*, that is on the other side of *Po* beyond the *Alpes*; 'The other has a curl'd grain, so curiously maculated, that from a 'neer resemblance, it was usually call'd the *Peacocks-tail*, &c. He goes on to commend that of *Istria*, and that growing on the Mountains for the best: But in the next chapter; *Pulcherrimum vero est Bruscum, multoque excellentius; etiamnum Mollusculum tuber utrumque arboris ejus Bruscum intortius crispum, Mollusculum simplicius sparsam; Et si magnitudinem mensarum caperet, haud dubie præferretur Cedro, nunc intra pugillares, lectorumque silicios aut laminas, &c. è Brusco fiunt mensæ nigrescentes, &c. Plin. l. 16. c. 15, 16.* 'The *Bruscum*, or 'Knur is wonderfully fair, but the *Molluscum* is counted most precious; both of them *Knobs* and swellings out of the *Tree*. The 'Bruscum is more intricately crisp'd; the *Molluscum* not so much; 'and had we *Trees* large enough to saw into Planks for *Tables*, 'twould be prefer'd before *Cedar* (or *Citron*, for so some Copies 'read it) but now they use it onely for small *Table-books*, and with 'its thin boards to *Wainscot Bed-Testers* with, &c. The *Bruscum* 'is of a blackish kind, with which they make *Tables*. Thus far *Pliny*. And such spotted *Tables* were the famous *Tigrin*, and *Pantherine* Curiosities of, not so call'd from being supported with figures carved like those Beasts, as some conceive, and was in use even in our *Grandfathers* dayes, but from its natural Spots and maculations; such a *Table* was that of *Cicero's*, which cost him 10000. *sestertees*; that of King *Juba*, sold for 15000. and another which I read of, valu'd at 140000 H. S. which at about 3 d. sterling, arives to a pretty Summ; and yet that of the *Mauritanian Ptoleomie*, was far richer, containing four Foot and an half diameter, three Inches thick, which is reported to have been sold for its weight

weight in *Gold* : Of that value they were, and so madly luxurious the age, that when they at any time reproach'd their *Wives* for their wanton Expensiveness in *Pearl* and other rich trifles, they were wont to retort, and turn the *Tables* upon their *Husbands*. The *Knot* of the *Timber* was the most esteem'd, and is said to be much resembled by the Female *Cypress*; we have now, I am almost persuaded, as beautiful Planks of some *Walnut-trees*, neer the *Root*; and of *Eugh*, *Ivy*, *Rose-wood*, and *Olive*, I have seen incomparable pieces; but the great Art was in the *Seasoning*, and *Politure*, for which last, the rubbing with a Mans *hand* who came warm out of the *Bath*, was accounted better then any Cloth, as *Pliny* reports. Some there be who contend, this *Citern* was a part neer the *Root* of the *Cedar*, which, as they describe *that*, is very *Oriental* and *Oderiferous*, but most of the Learned favour the *Citern*, and that it grew not far from our *Tangier*, about the foot of *Mount Atlas*, when haply some industrious Person might procure of it from the *Moors*; and I have not forgotten to put his Excellency my Lord *H. Howard* in mind of it, who will have all the opportunities of satisfying our Curiosity, that by comparing it with those elegant *Woods*, both our own *Countreys*, and the *Indies* furnish, we might pronounce something in the Controversie. Here I think good to add what honest *Palissy* Philosophises after his plain manner, about the reason of those pretty *undulations* and *chamfers*, which we so frequently find in diverse *Woods*; which he takes to be the *descent* as well as *ascent* of *Moisture* : For what else (sayes he) becomes of that *water* which we often encounter in the *Cavities*, when many branches *divaricate* and spread themselves at the *tops* of great *Trees* (especially *Pollards*) unless (according to its natural appetite) it sink into the very Body of the *Stem* through the *Pores*? For example, in the *Wall-nut*, you shall find, when 'tis old, that the *Wood* is admirably *figur'd*, and as it were *marbl'd*, and therefore much more esteem'd by the *Joyners*, *Cabinet-makers*, &c. then the *Young*, which is *paler* of *Colour*, and without any notable *Grain*, as they call it. For the *Rain* distilling along the *Branches*, when many of them break out into clusters from the *stem*, sinks *in*, and is the *Cause* of these *marks*; since we find it exceedingly full of *pores* : Do but *Plane* off a thin *chip*, or *sliver* from one of these *old Trees*, and interposing it 'twixt your *Eye* and the *Light*, you shall observe it to be full of innumerable *holes* (*much more perspicuous and ample, by the application of a good Microscope*) But above all, notable for these extravagant *Damaskings* and *Characters*, is the *Maple*; and 'tis notorious, that this *Tree* is very full of *Branches* from the *Root* to its very *Summit*, by reason that it produces no considerable *Fruit* : These *Arms* being frequently cut, the *Head* is more surcharged with them, which spreading like so many *Raies* from a *Center*; form that *hollownesse* at the top of the *Stem* whence they shoot, capable of containing a good quantity of *Water* every time it *Raines* : This sinking into the *pores*, as was before hinted, is compell'd to divert its course as it passes through

through the Body of the *Tree*, where-ever it encounters the *knot* of any of those *Branches* which were cut off from the *stem*; because their *Roots* not onely deeply penetrate towards the *heart*, but are likewise of themselves very *hard* and *impervious*; and the frequent *obliquity* of this Course of the subsiding *moisture* by reason of these obstructions, is, as may be conceived, the cause of those curious *works*, which we find remarkable in *this*, and other *woods*, whose *Branches* grow thick from the *Stem*. We have shewed how by *Culture* and stripping up, it arrives to a goodly *Tree*; and surely, there were some of them of large bulk, and noble *Shades*, that *Virgil* should choose it for the *Court* of his *Evander*, one of his *Worthiest Princes* in his best of *Poems* fitting in his *Maple-Throne*; and when he brings *Aeneas* into the *Royal Cottage*, he makes him this memorable *Complement*; *Greater*, sayes great *Cowley*, than ever was yet spoken at the *Escurial*, the *Louvre*, or *Whitehall*.

This humble *Roof*, this *Rustique Court*, said he,
Receiv'd *Alcides* crown'd with *Victorie* :
Scorn not (great *Gueſt*) the *Steps* where he has trod,
But contemn *Wealth*, and imitate a *God*.

—Hæc (inquit) limina *Vidor*
Alcides—

CHAP. XII.

Of the *Sycomor*.

Sycomor.

1. **T**HE *Sycomor*, falsely so called, is, our *Acer majus*, one of the *Maples*, and is much more in reputation for its shade than it deserves; for the leaves which fall early (like those of the *Ash*) turn to *Mucilage*, and putrefie with the first moisture of the season; so as they contaminate and mar our *Walks*, and are therefore by my consent to be banish'd from all curious *Gardens* and *Avenues*.

2. There is in *Germany* a better sort of *Sycomor* then ours, where with they make *Saddle trees*, and divers other things of use; our own is excellent for *Trenchers*, *Cart*, and *Plow-timber*, being light, tough, and not much inferiour to *Ash* it self; and if the trees be very tall and handsome, are the more tolerable for distant *Walks*, especially where other better trees prosper not so well, or where a sudden shade is expected.

CHAP.

CHAP. XIII.

Of the Horn-beam.

1. *O*strys the Horn-beam, in Latine ignorantly the *Carpinus*, is *Horn-beam*. planted of *Sets*; though it may likewise be raised from the *seeds*, which being mature in *August*, should be sown in *October*; but the more expeditious way is by *Sets*, of about an inch *diameter*, and cut within half a foot of the earth: thus it will advance to a considerable Tree. The places it chiefly desires to grow in are in cold *hills*, and in the barren and most expos'd parts of *woods*.

2. Amongst other uses which it serves for, as *Mill-cogs*, &c. (for which it excells either *Tew* or *Crab*) *Toak timber*. (whence of old 'twas called *Uzia*) Heads of *Beetles*, Stocks and Handles of *Tools*; It is likewise for the *Turners* use excellent: Good *Fire-wood*, where it burns like a *candle*, and was of old so employ'd;

Carpinus tædus fissâ faciesque dabit.

(For all which purposes its extreme toughness and whiteness commends it to the *Husbandman*.) Being planted in small *Fosses* or *Trenches*, at half a foot *intervall*, and in the single row it makes the noblest, and the stateliest *Hedges* for long *Walks* in *Gardens*, or *Parks*, of any Tree whatsoever whose leaves are *deciduous*, and forsake their Branches in *Winter*; because it grows tall, and so sturdy, as not to be wronged by the *Winds*: Besides, it will furnish to the very foot of the *Stem*, and flourishes with a glossie and polish'd *verdure* which is exceeding delightful, of long continuance, and of all other the harder Woods, the speediest Grower; maintaining a slender, upright *stem*, which does not come to be bare and sticky in many years. That admirable *Espalier-hedge* in the long middle-walk of *Luxembourg Garden* at *Paris* (than which there is nothing more graceful) is planted of this Tree; and so is that *Cradle*, or *Close walk*, with that perplext *Canopy*, which covers the seat in his *Majesties Garden* at *Hampton-Court*. These *Hedges* are *tonfile*; but where they are maintain'd to fifteen, or twenty foot height (which is very frequent in the places before mention'd) they are to be cut, and kept in order with a *Sythe* of four foot long, and very little *falcated*; this is fix'd on a long *sneed* or straight handle, and does wonderfully expedite the trimming of *these*, and the like *Hedges*.

3. They very frequently plant a *Clump* of these Trees before the *Entries* of most of the great *Towns* in *Germany*, to which they apply *Timber-Frames* for convenience, and the *People* to sit and solace

in. *Scamozzi* the *Architect*, sayes, that in his time he found *one* whole Branches extended seventy foot in breadth : This was at *Vuinſen* near the *Necker*, belonging to the Duke of *Witemberg* : But that which I find planted before the Gates of *Strasburgh*, is a *Platanus* and a *Lime tree* growing hard by one another, in which is erected a *Pergolo* eight foot from the ground, of fifty foot wide, having ten Arches of twelve foot height, all shaded with their foliage ; and there is besides this, an Over-grown *Oak*, which has an *Arbour* in it of 60 foot diameter : hear we *Rapinus* describe the use of our *Horn-beam* for these and other Elegancies.

In Walkes the *Horn-beam* stands, or in a Maze
Through thousand self-entangling Labyrinths strays :
So claspe the Branches lopp'd on either side,
As though an *Alley* did two *Walls* divide :
This Beauty found, Order did next adorne
The Boughs into a thousand figures shorne,
Which pleasing Objects wearineſſe betray'd,
Your feet into a *Wildernesse* convey'd.
Nor better Leaf on twining Arbor spread,
Against the scorching *Sun* to shield your head.

In tractus longos facilis tibi *Carpinus* ibit,
Mille per errores, indeprehenſusque recessum,
Et molles tendens ſeſſo seu parietis ramos,
Præbet viridem diverſo e margine ſcenam.
Primus honos illi quondam, poſt aditum ordo eſt,
Attonſæque coma, & formæ quaſita voluptas
Innumeri, ſartoque via, obliquoque recessu :
In tractus æſta eſt longos & opaca vireta.
Quinetiam egregia tendens umbracula frondis
Temperat ardentem ramis ingentibus æſtus.

CHAP. XIV.

Of the Lime-Tree.

Lime-Tree.

The *Lime-Tree*, or [*Linden*] is of two kinds : the *Male* (which some allow to be but a finer sort of *Elm*) is harder, fuller of knots, and of a redder colour ; but producing neither *Flower*, nor *Seed*, as does the *Female*, whose *Blossom* is very odoriferous, perfuming the *Air* : The *Wood* is likewise thicker, of small pith, and not obnoxious to the *Worm*, so as it seems *Theophrastus*, de *Pl. l. 3. c. 10.* said true, that though they were of both Sexes διαφόρων δὲ τῇ μορφῇ τῇ ὁλῇ &c. yet they totally differ'd as to their form. We send commonly for this Tree into *Flanders* and *Holland*, to our excessive cost, whiles our own Woods do in some places spontaneously produce them, and though of somewhat a smaller leaf, yet altogether as good, apt to be civiliz'd, and made more florid. From thence I have received many of their *Berries* ; so as it is a shameful negligence, that we are no better provided of *Nurseries*, of a Tree so choice, and universally acceptable. For so they may be rais'd either of the *Seeds* in *October*, or (with better successe) by the *Suckers*, and *Plants*, after the same method, and in as great abundance as the *Elm*, like to which it should be cultivated. But not onely by the *Suckers*, at the *Roots*, but even by *Branches* lop'd from the head, may this Tree be propagated ;
and

and peeling off a little of the *Bark*, at a competent distance from the *Stem* or *Arms*, and covering it with *Lime* mingled with rich *Earth*, they will shoot their *fibers*, and may be seasonably separated: But to facilitate *this* and the like attempts, it is advisable to apply a *ligature* above the place, when the *Sap* is ascending, or beneath it, when it descends.

2. The *Lime-tree* affects a rich feeding Soil; in such Ground their growth will be almost incredible for speed and spreading. They may be Planted as big as ones Leg; their *Heads* topp'd at about six foot *bole*; thus it will become (of all other) the most proper and beautiful for *Walks*, as producing an upright *Body*, smooth and even *Bark*, ample *Leaf*, sweet *Blossom*, and a goodly *Shade* at distance of eighteen or twenty foot.

3. The *Prince Elector* did lately remove very great *Lime-trees* out of one of his *Forests*, to a steep Hill exceedingly expos'd to the heat of the *Sun* at *Hidelbourg*; and that in the midst of *Summer*: They grow behind that strong *Tower* on the *South-west*, and most torrid part of the eminence; being of a dry reddish barren *Earth*; yet do they prosper rarely well: But the *Heads* were cut off, and the *Pits* into which they were transplanted, were (by the industry and direction of *Monsieur de Son*, a *Frenchman*, that admirable *Mechanican*, who himself related it to me) fill'd with a composition of *Earth* and *Cow-dung*, which was exceedingly beaten, and so diluted with *Water*, as it became almost a liquid *pap*: It was in *this* that he plunged the *Roots*, covering the surface with the *Turf*: A singular example of removing so great *Trees* at such a *season*, and therefore by me taken notice of here expressly.

4. The *Timber* of a well-grown *Lime* is convenient for any use that the *Willow* is; but much to be preferr'd, as being both stronger, and yet lighter; whence *Virgil* calls them *tilias leves*; and therefore fit for *Tokes*, and to be turn'd into *Boxes* for the *Apothecaries*; and *Columella* commends *Arculus tiliaceas*. And because of its *Colour* and easie working, *Architects* make with it *Modells* for their designed *Buildings*; and small *Statues*, and little curious *Figures* have been Carved of this wood. With the *twigs* they made *Baskets*, and *Cradles*, and of the smoother side of the *Bark*, *Tablets* for *Writing*; for the antient *Philyra* is but our *Tilia*. *Bellonius* says, that the *Grecians* made *Bottles* of it, which they finely *Rozin'd* within side, also *Lattices* for *Windows*. The *Gravers* in *Wood* do sometimes make use of this fine material; and even the coarsest *membrane*, or *slivers* of the *Tree* growing 'twixt the *Bark* and the main *Body*, they now twist into *Raff-ropes*; Besides the *Truncheons* make a far better *Coal* for *Gun-powder* than that of *Alder* it self: And the extraordinary candor and lightness, has dignifi'd it above all the *Woods* of our *Forest*, in the hands of the Right Honourable the *White-stave* Officers of His *Majesties* Imperial Court. Those royal *Plantations* of these *Trees* in the *Parks* of *Hampton Court*, and *St. James's*, will sufficiently instruct any man how these (and indeed all other

Trees which stand single) are to be govern'd, and defended from the injuries of *Beasts*, and sometimes more *unreasonable* Creatures, till they are able to protect themselves. In *Holland* (where the very *High ways* are adorn'd with them) they frequently clap three, or four *Deal-boards* (in manner of a close trunk) about them; but it is not so well; because it keeps out the *Air*, which should have free access, and intercourse to the *bole*, and by no means be excluded from flowing freely about them, or indeed any other *Trees*; provided they are secur'd from the violence of impetuous winds, &c. as his *Majesties* are, without those close *Coffins*, in which the *Dutch-men* seem rather to bury them alive: In the meantime, is there a more ravishing, or delightful object then to behold some intire *streets*, and whole *Towns* planted with these *Trees*, in even lines before their doors, so as they seem like *Cities* in a *Wood*? this is extreamly fresh, of admirable effect against the *Epilepsie*, for which the delicately sented *blossoms* are held prevalent; and skreens the Houses both from *Winds*, *Sun*, and *Dust*; then which there can be nothing more desirable where *Streets* are much frequented.

The stately *Linn*, smooth, gentle, streight, and fair,
(With which no other *Dryad* may compare)
With verdant locks, and fragrant Blossoms deckt,
Does a large, ev'n, odorate Shade project.

Sic Philyra: *hanc omnis formosior altera surgit*
Inter Hamadryades: molliissima, candida, laevi,
Et viridante coma, & benivolenti flore superba,
Spargit odoratam latè, atque aqualiter umbram.
Coulei l. 6. Pl.

The distance for *Walks* may in rich ground be eighteen foot, in more ordinary Soil, fifteen, or sixteen.

CHAP. XV.

Of the Quick-Beam.

Quick-beam. 1. **T**HE *Quick-beam* [*Ornus*, or as the *Pinax* more peculiarly, *Fraxinus bubula*, others, the *Wild Sorb*] or (as some term it) the *Witch*, is a species of *wild-Ash*. The berries which it produces in *October*, may then be sown; or rather the *Sets* planted: It rises to a reasonable stature, shoots upright, and slender; and consists of a fine smooth *bark*. It delights to be both in *Mountains* and *Woods*, and to fix it self in good light ground; *Virgil* affirms, 'twill unite with the *Peare*.

2. Besides the use of it for the *Husbandmans Tools*, the *Wheelwright* commends it for being all heart; and our *Fletchers* for *Bowes* next to *Engb*, which we ought not to passe over, for the

the glory of right *English* Ancestors : In a *Statute* of *Hen. 8.* you have it mention'd : It is excellent *Fuel*; but I have not yet observed any other use, save that the *Blossoms* are of an agreeable scent, and the *Berries* such a tempting Bait for the *Thrushes*, that as long as they last, you shall be sure of their Company. Some highly commend the *Juice* of the *berries*, which (fermenting of it self) if well preserv'd, makes an excellent Drink, against the *Spleen* and *Scorbut* : *Ale* and *Beer* Brew'd with these *Berries*, being ripe, is an incomparable Drink

CHAP. XVI.

Of the Birch.

1. **T**He Birch [*Betula*] is altogether produc'd of *Suckers*, ^{Birch.} (though it sheds a kind of *Samara* about the *Spring*) which being planted at four or five foot interval, in small *Twigs*, will suddenly rise to *Trees*; provided they affect the ground, which cannot well be too Barren; for it will thrive both in the dry, and the Wet, Sand, and Stony, *Marshes*, and *Bogs*; the *Water-galls*, and *unliginous* parts of *Forests* that hardly bear any *Grass*, do many times spontaneously produce it in abundance, whether the place be high, or low, and nothing comes amiss to it. Plant the small *Twigs*, or *Suckers* having *Roots*, and after the first year, cut them within an *inch* of the surface; this will cause them to sprout in strong and lusty *tufts*, fit for *Coppse*, and *Spring-woods*; or, by reducing them to one *stem*, render them in a very few years fit for the *Turner*. For

2. Though *Birch* be of all other the worst of *Timber*, yet has it its various uses, as for the *Husbandmans Ox-yokes*; also for *Hoops*, *Paniers*, *Brooms*, *Wands*, *bavin bands*, and *Wythes* for *Fagots*; and claims a memory for *Arrows*, *bolts*, *Shafts*, our old *English* Artillery; also for *Dishes*, *Bowles*, *Ladles*, and other domestic Utensils, in the good old dayes of more simplicity, yet of better and truer *Hospitality* : Also for *Fuel*, great and small *Coal*, which last is made by *charring* the slenderest *brush*, and *summities* of the twigs; as of the *Tops* and loppings *M. Howards* new *Tanne*. The inner *silken-bark* was antiently us'd for *Writing-Tables*, even before the Invention of *Paper*; and of the out-ward thicker, and courser part, are divers Houses in *Russia*, and those poor Northern Tracts cover'd, in stead of *Slates*, and *Tyle* : 'Tis affirm'd by *Cardan*, that some *Birch-roots* are so very extravagantly rein'd, as to represent the Shapes and Images of *Beasts*, *Birds*, *Trees*, and

many other pretty resemblances. Lastly, of the *whitest* part of the *old Wood*, found commonly in doating *Birches*, is made the grounds of our *Gallants Sweet-Powder*; and of the quite consum'd and rotten, such as we find reduc'd to a kind of *reddish Earth* in *superexannuated* hollow-trees, is gotten the best Mould for the raising of divers *Seedlings* of the rarest *Plants* and *Flowers*; to say nothing here of the *Magisterial Fases*, for which antiently the *Gudgels* were us'd by the *Litſor*; as now the gentler *Rods* by our tyrannical *Pædagogues*.

3. I should here add the *uses* of the *Water* too, had I full permission to tamper with all the *Medicinal* virtues of *Trees*: But if the sovereign effects of the *Juice* of this despicable *Tree* supply its other defects (which makes some judge it unworthy to be brought into the *Catalogue* of *Woods* to be propagated) I may for *once* be permitted to play the *Empiric*, and to gratifie our laborious *Wood-man* with a Draught of his own *Liquor*: And the rather, because these kind of *Secrets* are not yet sufficiently cultivated; and ingenious *Planters* would by all means be encourag'd to make more *trials* of this nature, as the *Indians*, and other *Nations* have done on their *Palmes*, and *Trees* of several kinds, to their great emolument. The *Mystery* is no more than this: About the beginning of *March* (when the *Buds* begin to be proud and turgid) with a *Chisel* and a *Mallet*, cut a slit almost as deep as the very *Pith*, under some *bough*, or branch of a well spreading *Birch*; cut it *oblique*, and not *long-ways* (as a good *Chirurgion* would make his *orifice* in a *Vein*) inserting a small *stone* or *chip*, to keep the *Lips* of the wound a little open: Sir *Hugh Plat*, giving a general Rule for the gathering of *Sap*, and *Tapping* of *Trees*, would have it done within one foot of the ground, the first *rind* taken off, and then the white *Bark* slit overthwart, no farther then to the *Body* of the *Tree*: Moreover, that this wound be made onely in that part of the *bark* which respects the *South west*, or between those quarters; because (says he) little, or no *Sap* riseth from the *Northern*. In this *slit*, by the help of your *knife* to open it, he directs that a *leaf* of the *Tree* be inserted, first fitted to the dimensions of the *slit*, from which the *Sap* will distil in manner of *filtration*; Take away the *leaf*, and the *bark* will close again, a little *Earth* being clapped to the *slit*: Thus the *Knight* for any *Tree*: But we have already shew'd how the *Birch* is to be treated: Fasten therefore a *Bottle*, or some such convenient *Vessel* appendant: This does the effect as well as *perforation* or *tapping*: Out of this aperture will extil a *limpid* and clear *Water*, retaining an obscure smack both of the *tast* and *odor* of the *Tree*; and which (as I am credibly inform'd) will in the space of *twelve*, or *fourteen* dayes preponderate, and out-weigh the whole *Tree* it self, *Body*, and *Roots*; which if it be constant, and so happen likewise in other *trees*, is not onely stupendious, but an *experiment* worthy the Consideration of our profoundest *Philosophers*: *an ex sola aqua fiunt Arborea*? whether *Water* only be the Principle of *Vegetables*,

Vegetables, and consequently of *trees*: For evident it is, that we know of no *tree* which does more copiously attract, be it that so much celebrated *Spirit of the World* (as they call it) in Form of *Water* (as some) or a certain *specificque liquor* richly impregnated with this *Balsamical* property: That there is such a *Magnet* in this simple *tree* as does manifestly draw to it self some *occult* and wonderful *virtue*, is notorious; nor is it conceivable, indeed, the difference between the efficacy of that *Liquor* which distills from the *bale*, or parts of the *tree* neerer to the *Root* (where Sir *Hugh* would celebrate the *Incision*) and that which *weeps* out from the more sublime *Branches*, more impregnated with this *Astral* *Virtue*, as not so near the *Root*, which seems to attract rather a cruder and more common *water*, through fewer *strainers*, and neither so pure and *Aërial* as in those refined *percolations*, the nature of the places where these *trees* delight to grow (for the most part lofty, dry, and barren) consider'd. But I refer these *Disquisitions* to the *Learned*; especially, as mention'd by that incomparable *Philosopher*, and my most noble Friend, the honourable Mr. *Boyle*, in his *Second* part of the usefulness of *Natural Philosophy* Sect. 1. *Essay* 3^d. where he speaks of the *Manna del Corpo*, or *Trunk Manna*, as well as of that *Liquor* from the *hough*; so of the *Sura* which the *Coco-trees* afford; and that *Polonian* secret of the *Liquor* of the *Walnut-tree* *Root*; with an encouragement of more frequent *Experiments* to educe *Saccharine* substances upon these occasions: But the *Book* being publish'd so long since this *Discourse* was first ready, I have onely here the liberty to refer the *Reader* to one of the best *Entertainments* in the world.

4. But whilst this *Second Edition* is now under my hand, there comes to me divers *Papers* upon this *subject* experimentally made by a worthy *Friend* of mine, a *Learned* and most industrious *Person*, which I had here once resolv'd to have publish'd, according to the generous liberty granted me for so doing; but understanding he was still in pursuit of that *usefull*, and curious *Secret*, I chang'd my resolution into an earnest addresse, that he would communicate it to the *World* himself, together with those other excellent *Enquiries*, and observations which he is adorning for the benefit of *Planters*, and such as delight themselves in those innocent *Rusticities*. I will onely by way of *Corolarie*, hint some particulars for satisfaction of the *Curious*; and especially that we may in some sort gratifie those earnest *suggestions* and *Queries* of the most obliging *Publisher* of the *Philosophical Transactions*, to whose *indefatigable pains* the *Learned World* is infinitely engag'd. In compliance therefore to his *Queries*, *Monday Octob. 19. 1668. Numb. 40. p. 797, 821, &c.* these *Generals* are submitted: That in such *Trials* as my *Friend* essay'd, he has not yet encountred with any *Sap* but what is very clear and sweet; especially that of the *Sycamor*, which has a *dulcoration* as if mixed with *sugar*, and that it runs one of the earliest: That the *Maple* distill'd when quite rescind'd from the *Body*, and even whilst he yet held it in his hand:

hand : That the *Sycomor* ran at the *Root*, which some dayes before yielded no *Sap*, from his *branches* ; the *Experiment* made at the end of *March* : But the accurate knowledge of the nature of *Sap*, and its *periodic* Motions and properties in several *Trees*, should be observed by some at entire *leisure* to attend it daily, and almost continually, and will require more than any one persons industry can afford : For it must be enquir'd concerning every *tree*, its *age*, *soyl*, *scituation*, &c. the variety of its ascending *Sap* depending on it ; and then of its *Sap* ascending in the *branches* and *Roots* ; descending in cut *branches* ; descending from *Root* and not from *branches* ; the *seasons* and difference of time in which those *Accidents* happen, &c. He likewise thinks the best expedient to procure store of *Liquor*, is, to cut the *Trees* almost quite through all the *Circles* on both sides the *Pith*, leaving only the outmost *Circle* and the *bark* on the *North*, or *North-East* side unpierced ; and this *hole* the larger it is bored, the more plentifully 'twill distill ; which if it be *under*, and *through* a large *Arm*, neer the *Ground*, it is effected with greatest advantage, and will need neither *stone* nor *Chip* to keep it open, nor *Spigot* to direct it to the *Recipient*. Thus it will in a short time, afford *Liquor* sufficient to Brew with ; and in some of these sweet *Saps*, one Bushel of *Mault* will afford as good *Ale* as four in ordinary *Waters*, even in *March* itself ; in others, as good as two Bushels ; for this, preferring the *Sycomor* before any other : But to preserve it in best condition for *brewing*, till you are stor'd with a sufficient quantity, it is advis'd that what first runs, be *insolated*, till the remainder be prepar'd to prevent its growing *sour* : But it may also be *fermented* alone by such as have the *Secret* : To the *Curious* these *Essayes* are recommended. That it be immediately stopp'd up in *bottles* in which it is gathered, the *Corks* well wax'd and expos'd to the *Sun*, till (as was said) sufficient quantity be run ; then let so much *Rye-bread* (toasted very dry, but not burnt) be put into it as will serve to set it a working ; and when it begins to *ferment*, take it out, and *Bottle* it immediately. If you add a few *Cloves*, &c. to steep in it, 'twill certainly keep the year about : 'Tis a wonder how speedily it extracts the *tast*, and *tincture* of the *spice* : Mr. Boyle proposes a *sulphurous* fume to the *bottles* : *Spirit* of *Wine* may haply not onely preserve, but advance the *Vertues* of *Saps* ; and *Infusions* of *Raisins* are obvious, and without decoction best, which does but spend the more delicate parts. Note that the *Sap* of the *Birch* will make excellent *Meade*.

5. To these Observations, that of the *Weight*, and *Vertue* of the several *Juices* would be both useful and *Curious* : As whether that which proceeds from the *bark*, or between *that* and the *Wood* be of the same nature with that which is suppos'd to spring from the pores of the woody *Circles* ? and whether it rise in like quantity upon comparing the *incisures* ? All which may be try'd, first attempting through the *bark*, and saving that apart, and then

perforating

perforating into the *Wood* to the thicknesse of the *bark* or more; with a like separation of what *distills*. The period also of its *current* would be calculated; as how much proceeds from the *bark*, in one *hour*, how much from the *Wood* or *Body* of the *Tree*, and thus every *hour*, still a deeper incision with a good large *Auge*, till the *Tree* be quite perforated: Then by making a *second hole* within the *first*, fitted with a lesser pipe, the interior *heart-sap* may be drawn apart, and examin'd by *Weight*, *Quantity*, *Colour*, *Distillation*, &c. And if no difference perceptible be detected, the presumption will be greater, that the difference of *heart* and *Sap* in *Timber*, is not from the *Saps* plenty or penury, but the *Season*; and then possibly, the very *season* of *squaring*, as well as *Felling* of *Timber*, may be considerable to the preservation of it.

6. The notice likewise of the *Saps* rising more plentifully, and constantly in the *Sun*, than *Shade*; more in the *Day* than *Night*, more in the *Roots* than *Branch*, more *Southward* than *Northward*, &c. may yield many useful *Observations*: As for *Planting*, to set thicker, or thinner (*scætera sint paria*) namely the nature of the *Tree*, *Soyl*, &c.) and not to shade over much the *Roots* of those *Trees* whose *stems* we desire should mount, &c. That in *transplanting* *Trees* we turn the best, and largest *Roots* towards the *South*, and consequently the most ample and spreading part of the *head* correspondent to the *Roots*: For if there be a strong *Root* on that *Quarter*, and but a feeble attraction in the *Branches*, this may not always counterpoise the weak *Roots* on the *North-side*, damnified by the too puissant attraction of over large *Branches*: this may also suggest a cause why *Trees* flourish more on the *South-side*, and have their *Integument* and *Coates* thicker on those aspects annually, with divers other useful *speculations*, if in the mean time they seem not rather to be *puntillos*, over nice for a plain *Forester*.

7. To shew our *Reader* yet, that these are no novel *Experiments*, we are to know, that a large Tract of the World almost altogether subsist on these *Treen Liquors*; Especially, that of the *Date*, which being grown to about seven or eight foot in height, they wound, as we have taught, for the *Sap*, which they call *Toddy*, a very famous *Drink* in the *East-Indias*. This *Tree* increasing every year about a foot, near the opposite part of the first *Incisure*, they pierce again, changing the *Receiver*; and so still by opposite wounds and Notches, they yearly draw forth the *Liquor*, till it arrive to near *thirty* foot upward, and of these they have ample *Groves* and *Plantations* which they set at seven or eight foot distance: But then they use to *percolate* what they extract, through a *Stratum* made of the *Rind* of the *Tree*, well contus'd and beaten, before which preparation it is not safe to *Drink* it; and 'tis observ'd, that some *Trees* afford a much more generous *Wine*, than others of the same kind. In the *Coco* and *Palmeto* *Trees*, they Chop a Bough as we do the *Betula*; but in
the

the *Date*, make the *Incision* with a *Chisel* in the Body very neatly, in which they stich a *Leaf* of the Tree as a *lingula* to direct it into the appendent *Vessel*, which the subjoyn'd *Figure* represents, and illustrates with its improvement to our former Discourse :

Note, If there be no *sitting Arms*, the hole thus obliquely perforated, and a *Faucet* or pipe inserted, will lead the Sap into the Recipient.



(a. b.) the body of the Tree (g.) board at that part of the Arm (f.) joyn'd to the Stem, with an *Augre* of an inch or more diameter, according to the bignesse of the Tree. (c.) a part of the Bark bent down into the mouth of the Bottle (e.) to conduct the Liquor into it. (d.) the String about the Arm (f.) by which the Bottle hangs.

8. The *Liquor* of the *Birch* is esteem'd to have all the Virtues of the *Spirit of Salt*, without the danger of its *acrimony*; most powerful for the dissolving of the *Stone* in the Bladder: *Helmont* shews how to make a *Beer* of the *Water*; but the *Wine* is a most rich

rich *Cordial*, curing (as I am told) Consumptions, and such interior Diseases as accompany the *Stone* in the *Bladder* or *Reins*: This *Wine*, exquisitely made, is so strong, that the common sort of *stone-bottles* cannot preserve the *spirits*, so subtile they are and *volatile*; and yet it is gentle, and very harmlesse in operation within the *body*, and exceedingly sharpens the *Appetite*, being drank *ante pastum*: I will present you a *Receipt*, as it was sent me by a fair *Lady*.

9. To every Gallon of *Birch-water* put a quart of *Hony* well stirr'd together; then boyl it almost an hour with a few *Cloves*, and a little *Limon-peel*, keeping it well scumm'd: When it is sufficiently boil'd, and become cold, add to it three, or four spoonfulls of good *Ale* to make it work (which it will do like new *Ale*) and when the *Taft* begins to settle, *bottle* it up as you do other *winy* Liquors. It will in a competent time become a most brisk, and spiritous *Drink*, which (besides the former virtues) is a very powerful *opener*, and doing wonders for cure of the *Ptisick*: This *Wine* may (if you please) be made as successfullly with *Sugar* in stead of *Hony*, lbj. to each Gallon of *Water*; or you may dulcifie it with *Raisins*, and compose a *Raisin-wine* of it. I know not whether the quantity of the sweet *Ingredients* might not be somewhat reduc'd, and the operation improv'd: But I give it as receiv'd.

10. But besides these, *Beech*, *Alder*, *Ash*, *Elder*, &c. would be attempted for *Liquors*: Thus *Crabs*, and even our very *brambles*, may possibly yield us *medical* and useful *Wines*. The *Poplar* was heretofore esteem'd more *Physical* than the *Betula*. The *Sap* of the *Oak*, juice, or decoction of the inner bark cures the *Fashions*, or *Farcy*, a virulent and dangerous infirmity in *Horses*, and which (like *Cancers*) were reputed incurable by any other *Topic*, then some actual, or potential *cantery*: But, what is more noble; a dear Friend of mine assur'd me, that a Country Neighbour of his (at least *four-score* years of age) who had lain sick of a bloody *Strangury* (which by cruel torments reduc'd him to the very *article* of Death) was, under *God*, recover'd to perfect, and almost *miraculous* health, and strength (so as to be able to fall stoutly to his labour) by one sole Draught of *Beer*, wherein was the decoction of the internal bark of the *Oak-tree*; And I have seen a Composition of an admirable *sudorific*, and *diuretic* for all affections of the *Liver*, out of the like of the *Elm*, which might yet be drank daily as our *Cophee* is, and with no lesse delight; but *Quacking* is not my *Trade*: I speak onely here as a plain *Husband-man*, and a simple *Forester*, out of the limits whereof I hope I have not unpardonably transgress'd. *Pan* was a *Physician*, and he (you know) was *President* of the *Woods*. But I proceed.

CHAP. XVII.

Of the *Hasel*.*Hasel.*

1. *Nux Sylvestris*, or *Corylus*, the *Hasel*, is best rais'd from the *Nuts*, which you shall sow like *Mast* in a pretty deep *furrow* toward the end of *February*: Light ground may immediately be sown and *harrow'd* in very accurately; but in case the mould be *clay*, plow it earlier, and let it be sufficiently mellow'd with the *Frosts*; and then the third year, cut your *Trees* near to the ground with a sharp *bill*, the *Moon* decreasing.

2. But if you would make a *Grove* for Pleasure, *Plant* them in *Fosses* at a *yard* distance, and cut them within half a foot of the earth, dressing them for three or four *Springs* and *Autumns*, by onely loosning the *Mould* a little about their roots. Others there are, who set the *Nuts* by hand at one foot distance, to be *transplanted* the third year at a yard asunder: But this work is not to be taken in hand so soon as the *Nuts* fall, till *Winter* be well advanc'd; because they are exceedingly obnoxious to the *Frosts*; nor will they sprout till the *Spring*; besides, *Vermine* are great devourers of them: Preserve them therefore *moist*, not *mouldy*; by laying them in their own *dry* leaves, or in *Sand*, till *January*.

Hasels from Sets and Suckers take.

Plantū & dura Coryli nascuntur

Georg 2.

3. From whence they thrive very well, the *shoots* being of the scantlings of small *wands*, and *switches*, or somewhat bigger, and such as have drawn divers *hairy* twiggs, which are by no means to be disbranch'd no more than their *Roots*, unless by a very sparing and discreet hand. Thus your *Coryletum* or *Copse* of *Hasels* being Planted about *Autumn*, may (as some practise it) be cut within three or four inches of the ground the *Spring* following, which the new *Cyon* will suddenly repair, in clusters and tufts of fair *poles* of twenty, and sometimes thirty foot long: But I rather should spare them till two, or three years after, when they shall have taken strong hold, and may be cut close to the very Earth; the improsperous, and feeble ones especially. Thus, are like-wile *Filberts* to be treated, both of them improv'd much by *transplanting*, but chiefly by *Grafting*, and it would be try'd with *Filberts*, and even with *Almonds* themselves, for more elegant Experiments.

4. For

4. For the *Place*, they above all affect *cold*, *barren*, *dry*, and *Sandy* grounds; also *Mountains*, and even *Rockie* Soils produce them; but more plentifully, if somewhat moist, dankish, and Mossie, as in the fresher *bottoms*, and sides of *Hills*, and in *Hedge-rows*. Such as are maintain'd for *Coppes*, may after Twelve years be fell'd the first time; the next at seven or eight, &c. for by this period their *Roots* will be compleatly vigorous. You may *Plant* them from *October* to *January*, provided you keep them carefully *Weeded* till they have taken fast hold.

5. The use of the *Hazel* is for *Poles*, *Spars*; *Hoops*, *Forks*, *Angling rods*, *Faggots*, *Cudgels*, *Coals*, and *Springs* to catch birds; and it makes one of the best *Coals*, once us'd for *Gun-powder*, being very fine and *Light*, till they found *Alder* to be more fit: There is no *Wood* which purifies *Wine* sooner, than the *Chippes* of *Hazel*: Also for *With's* and *Bands*, upon which I remember *Pliny* thinks it a pretty *Speculation*, that a *Wood* should be stronger to bind withal being bruis'd and divided, then when whole and entire; lastly, for *Riding Switches* and *Divinatory Rods* for the detecting and finding out of *Minerals*; at least, if that *Tradition* be no imposture. But the most signal Honour it was ever employ'd in, and which might deservedly exalt this humble, and common *Plant* above all the *Trees* of the *Wood*, is that of *Hurdles*; not for that it is generally us'd for the Folding of our Innocent *Sheep*, an Emblem of the *Church*; but for making the *Walks* of one of the first *Christian Oratories* in the *World*; and particularly in this *Island*, that venerable and Sacred Fabric at *Glastenbury*, founded by *S. Joseph of Arimathea*, which is storied to have been first compos'd but of a few small *Hazel-Rods* interwoven about certain *Stakes* driven into the ground; and Walls of this kind, in stead of *Laths* and *Punchions*, superinduc'd with a course *Mortar* made of *Loam* and *Straw*, does to this day, inclose divers humble *Cottages*, *Sheeds*, and *Out-Houses* in the *Country*; and 'tis strong and lasting for such purposes, whole, or cleft, and I have seen ample enclosures of *Courts* and *Gardens* so secur'd.

6. There is a compendious expedient for the thickning of *Coppes* which are too *transparant*, by laying of a *Sampler*, or *Pole* of an *Hazel*, *Ash*, *Poplar*, &c. of twenty, or thirty foot in length (the head a little lopp'd) into the ground, giving it a *Chop* near the foot, to make it succumb; this fastned to the earth with a *hook* or two, and cover'd with some fresh *mould* at a competent depth (as *Gardeners* lay their *Carnations*) will produce a world of *Suckers*, thicken, and furnish a *Copse* speedily. But I am now come to the *Water-side*; let us next consider the *Aquatic*.

CHAP. XVIII.

Of the Poplar, Aspen, and Abele.

Poplar.

1. **P***Opulus*. I begin this second *class* (according to our former *distribution*) with the *Poplar*, of which there are several kinds; *White, Black, &c.* (which in *Candy* 'tis reported bears *seed*) besides the *Aspen*. The *white* is the most ordinary with us, to be rais'd in abundance by every *set* or *slip*. Fence the ground as far as any old *Poplar* roots extend, they will furnish you with *suckers* innumerable, to be slipp'd from their *mothers*, and *transplanted* the very first year. You shall need no other *Nursery*. When they are young, their *leaves* are somewhat broader and rounder then when they grow aged. In moist and *boggie* places they will flourish wonderfully, so the ground be not *spewing*; but especially near the *margins* and banks of *Rivers*,

Populus in fluviis —

and in low, sweet and fertile grounds. Also *trunchions* of seven or eight foot long, thrust two foot into the *earth*, (a hole being made with a sharp hard *stake*, fill'd with *water*, and then with fine *earth* pressed in and close about them) when once *rooted*, may be cut at six inches above ground; and thus placed at a yard distant, they will immediately furnish a kind of *Copse*. But in case you plant them of *rooted trees*, or smaller *sets*, fix them not so deep; for though we bury the *trunchions* thus profound, yet is the *root* which they strike commonly but shallow. They will make prodigious *shoots* in 15 or 16 years; but then the *heads* must by no means be diminish'd, but the lower branches may, yet not too far up: the *foot* would also be cleansed every second year. This for the *White*. The *Black Poplar* is frequently *pollar'd* when as big as ones arm, eight or nine foot from the ground, as they trim them in *Italy* for their *Vines* to serpent on, and those they *poll* or *head* every second year, sparing the middle, streight and thriving-est *shoot*, and at the third year cut *him* also.

2. The *shade* of this *tree* is esteemed very wholesome in *Summer*, and the *leaves* good for *cattel*, which must be stripp'd from the cut boughs before they are faggotted. This to be done in the decrease of *October*, and reserv'd in bundles for the winter *fodder*. The *wood* of *white Poplar* is sought of the *Sculptor*, and they saw both sorts into *boards*, which, where they lie dry, continue a long time. Of this material they also made *Shields* of defence in *Sword and Buckler* days. *Dioscorides* writes, that the *bark* chopt small, and sow'd in rills, well and richly manur'd and watered, will

will produce a plentiful crop of *Mushrooms*. It is to be noted, that those *Fungi*, which spring from the putrid stumps of this tree, are not *venomous* (as of all or most other trees they are) being gathered after the first *Autumnal* rains.

3. They have a *Poplar* in *Virginia* of a very peculiar shap'd leaf, as if the point of it were cut off, which grows very well with the *curious* amongst us to a considerable stature. I conceive it was first brought over by *John Tradescant* under the name of the *Tulip-tree*, but is not that I find taken notice of in any of our *Herbals*; I wish we had more of them.

4. The *Aspen* only (which is that kind of *Libica* or white *Poplar*, *Aspens.* bearing a smaller and more tremulous leaf) thrusts down a more searching foot, and in this likewise differs, that he takes it ill to have his head cut off: *Pliny* would have short *trunchions* couched two foot in the ground (but first two days dried) at one foot and half distance, and then moulded over.

5. There is something a finer sort of white *Poplar*, which the *Dutch* call *Abele*, and we have much transported out of *Holland*: these are also best propagated of *slips* from the roots, the least of which will take, and may in *March*, at three or four years growth be transplanted. *Abele.*

6. In *Flanders* (not in *France*, as a late Author pretends) they have large *Nurseries* of them, which first they plant at one foot distance, the mould light and moist, by no means *clayie*, in which though they may shoot up tall, yet for want of root they never spread; for, as I said, they must be interr'd pretty deep, not above three inches above ground; and kept clean by pruning them to the middle shoot for the first two years, and so till the third or fourth. When you transplant, place them at eight, ten, or twelve foot intervall: They will likewise grow of layers, and even of cuttings in very moist places. In three years they will come to an incredible altitude; in twelve, be as big as your middle; and in eighteen or twenty, arrive to full perfection. A specimen of this advance we have had of an *Abele* tree at *Sion*, which being lopp'd in Febr. 1651, did by the end of *October* 52 produce branches as big as a mans wrist, and 17 foot in length: for which celerity we may recommend them to such late builders, as seat their houses in naked and unsheltered places, and that would put a guise of *Antiquity* upon any new *Inclosure*; since by these, whilest a man is in a voyage of no long continuance, his house and lands may be so covered, as to be hardly known at his return. But as they thus increase in bulk, their value (as the *Italian Poplar* has taught us) advances likewise; which after the first seven years is annually worth twelve pence more; So as the *Dutch* look upon a plantation of these trees as an ample portion for a daughter, and none of the least effects of their good Husbandry; which truly may very well be allow'd if that calculation hold, which the *Knight* has asserted, who began his plantation not long since about *Richmond*, that 30 lib. being laid out in these plants, would render at the least ten thousand pounds in eighteen years;

years ; every *tree* affording thirty *plants*, and every of them thirty more, after each seven years improving *twelve pence* in growth, till they arrived to their *acme*.

7. The *Black Poplar* grows rarely with us ; it is a stronger and taller tree than the *White*, the *leaves* more dark, and not so ample. Divers stately ones of these I remember about the banks of *Po* in *Italy* ; which *river* being the old *Eridanus*, so celebrated by the *Poets*, in which the temerarious *Phaeton* is said to have been precipitated, doubtless gave argument to that *fiction* of his sad Sisters *Metamorphosis* into these *trees* ; but for the *Amber* of their pretious *tears* I could hear of no such matter, while passing down that *River* towards *Ferrara*, I diverted my self with this story of the ingenious *Poet*. I am told there is a *Mountain Poplar* much propagated in *Germany* about *Vienna*, and in *Bohemia*, of which some trees have yielded *Planks* of a yard in breadth.

8. The best use of the *Poplar* and *Abele* (which are all of them hospitable trees, for any thing thrives under their *shades*) is for *Walks* and *Avenues* about *Grounds* which are situated low, and near the water, till coming to be very old, they are apt to grow knurly, and out of proportion. The *timber* is incomparable for all sorts of white wooden vessels, as *Trays*, *Bowls*, and other *Turners* ware ; and of especial use for the *Bellows-maker*, because it is almost of the nature of *Cork*, though not very solid, yet very close : also for wooden *heels*, &c. *Vitruvius* l. 2. de materia cadenda reckons it among the Building *Timbers*, quæ maxime in ædificiis sunt idoneæ. Likewise to make *Carts*, because it is exceeding light, for *Vine*, and *Hop-props*, and divers *viminious* works. The loppings in *January* are for the *fire* ; and therefore such as have proper *Grounds*, may with ease and in short time store themselves for a considerable family, where *fuel* is dear : but the truth is, it burns untowardly, and rather moulders away than maintains any solid heat. Of the *twigs* (with the *leaves* on) are made *Brooms*. The *Brya* or *Catkins* attract the *Bees*, as do also the *leaves* (especially of the *black*) more tenacious of the *Mel-dews* than most other *Forest-trees*, the *Oak* excepted.

Of the *Aspen* our *Wood-men* make *Hoops*, *Fire-wood*, and *Coals*, &c.

The juice of *Poplar* leaves drop'd into the *ears* allwages the pain ; and the *buds* contus'd and mix'd with *Hony*, is a good *Collyrium* for the *eyes*.

CHAP. XIX.

Of the Alder.

1. **A** *Lnus*, the Alder is of all other the most faithful lover of *ma- Alder.* tery and boggie places, and those most despis'd weeping parts or *water-galls* of Forests; — *crassisque paludibus Alni.* They are propagated of *Trunchions*, and will come of *seeds* (for so they raise them in *Flanders*, and make wonderful profit of the *plantations*) like the *Poplar*; or of *Roots*, which I prefer, being set as big as the small of ones leg, and in length about two foot; whereof one would be plunged in the *mud*. This profound fixing of *Aquatick trees* being to preserve them *steddy*, and from the concussions of the *winds*, and violence of *waters* in their *liquid* and slippery foundations. They may be placed at four or five foot distance, and when they have struck *root* you may *cut* them, which will cause them to spring in *clumps*, and to shoot out into many useful *Poles*. But if you plant smaller *Sets*, cut them not till they are arriv'd to some competent bigness; and that in a proper *season*: which is, for all the *Aquatics* not till *Winter* be well advanc'd, in regard of their *pithy* substance. Therefore, such as you shall have occasion to make use of before that period, ought to be well-grown, and *fell'd* with the *earliest*, and in the first *quarter* of the increasing *Moon*; that so the successive *shoot* receive no prejudice. But there is yet another way of planting *Alders* after the *Jersey* manner, and as I receiv'd it from a most ingenious *Gentleman* of that Country, which is, by taking *trunchions* of two or three foot long, at the beginning of *Winter*, and to bind them in *faggots*, and place the *ends* of them in *water* till towards the *Spring*, by which season they will have contracted a swelling *spire* or *knurr* about that part, which being set, does (like the *Gennet-moil Apple*) never fail of growing and striking root. There is a *black* sort more affected to *Woods* and drier grounds.
2. There are a sort of *Husbands* who take excessive pains in *stubbing* up their *Alders*, where ever they meet them in the *boggie* places of their grounds, with the same indignation as one would extirpate the most pernicious of *Weeds*; and when they have finished, know not how to convert their best *lands* to more profit than this (seeming despicable *plant* might lead them to, were it rightly understood. Besides, the *shadow* of this *tree* does feed and nourish the very *grass* which grows under it; and being set and well plashed, is an excellent defence to the banks of *Rivers*; so as I wonder it is not more practis'd about the *Thames*, to fortifie and prevent the

the mouldring of the *walls*, and the violent *weather* they are exposed to.

3. You may cut *Aquatic-trees* every third or fourth year, and some more frequently, as I shall shew you hereafter. They should also be abated within half a foot of the principal *head*, to prevent the perishing of the main *Stock*; and besides, to *accelerate* their sprouting. In setting the *Trunchions* it were not amiss to prepare them a little after they are fitted to the size, by laying them a while in *water*; this is also practicable in *Willows*, &c.

4. Of old they made *Boats* of the greater parts of this Tree, and excepting *Noah's Ark*; the first *Vessels* we read of, were made of this *Wood*.

When hollow Alders first the Waters tri'd,

Tunc alnos primum fluvii sensere cavatas.

Georg. 1.

And down the rapid Pow light Aldars glide.

Nec non & torrentem undam levem innatat alnus
Missa Pado——

2.

And as *then*, so *now*, are over-grown *Alders* frequently sought after, for such *Buildings* as lye continually under *water*, where it will harden like a very *stone*; whereas being kept in any unconstant temper it *Rots* immediately, because its natural *humidity* is of so near affinity with its adventitious; as *Scaliger* assigns the cause. *Vitruvius* tells us, that the *Morasses* about *Ravenna* in *Italy*, were pil'd with this *Timber*, to *superstruct* upon, and highly commends it. I find also they us'd it under that famous *Bridge* at *Venice*, the *Rialto* which passes over the *Gran-Canal* bearing a vast weight.

5. The *Poles* of *Alder* are as useful as those of *Willows*; but the *Coals* far exceed them; especially for *Gun-powder*: The *wood* is likewise useful for *Piles*, *Pumps*, *Flop-poles*, *Water-pipes*, *Troughs*, *Sluces*, small *Trays*, and *Trenchers*, *Wooden-heels*; the *bark* is precious to *Dyers*, and some *Tanners* and *Leather-dressers* make use of it; and with it, and the *Fruits* (in stead of *Galls*) they make *Ink*. The fresh *Leaves* alone applied to the naked *soal* of the *Foot*, infinitely refresh the surbated *Traveller*; and the swelling *bunches* which are now and then found in the old *Trees*, afford the *Inlayer* pieces curiously *chambletted* and very hard, &c. but the *Fagots* better for the *Fire* than for the *draining* of *Grounds*, by placing them (as the guise is) in the *Trenches*; which old rubbish of *Flints*, *Stones*, and the like grosse materials, does infinitely exceed, because it is for ever, preserves the *Draings* hollow, and being a little moulded over will produce good *grass*, without any detriment to the ground; but this is a *secret*, not yet well understood, and would merit an expresse *Paragraph*, were it here seasonable,

— & jam nos inter opacas
Missa vocat Salices —

CHAP.

CHAP. XX.

Of the Withy, Sally, Ozier, and Willow.

1. *Salix*, since *Cato* has attributed the third place to the *Salicetum*, preferring it even next to the very *Ortyard*; and (what one would wonder at) before even the *Olive*, *Meadow*, or *Corn-field* it self (for *Salicetum tertio loco, nempe post vineam, &c.*) and that we find it so easily rais'd, of so great and universal Use, I have thought good to be the more particular in my Discourse upon them; especially, since so much of that which I shall Publish concerning them, is deriv'd from the long Experience of a most Learned and ingenious Person, from whom I acknowledge to have receiv'd many of these hints. Not to perplex the Reader with the various names, *Greek*, *Gallic*, *Sabinic*, *Amerine*, *Vitex*, &c. better distinguish'd by their growth, and bark; and by *Latine Authors* all comprehended under that of *Salices*; and our *English Books* reckon them promiscuously thus; The *Common-white Willow*, the *Black*, and the *Hard-black*, the *Rose of Cambridge*, the *Black-Withy*, the *Round-long Sallow*; the *longest Sallow*, the *Lesser-broad-leav'd Willow*, *Silver Sallow*, *Upright broad-Willow*, *Repent broad-leav'd*, the *Red-stone*, the *Lesser Willow*, the *Strait-Dwarf*, the *Creeper*, the *Black-low-Willow*, the *Willow-bay*, and the *Ozier*. I begin with the *Withy*.

2. The *Withy* is a reasonable large Tree, and fit to be planted on high Banks; because they extend their Roots deeper then either *Salleys* or *Willows*. For this reason you shall Plant them at ten, or twenty foot distance; and though they grow the slowest of all the *Twiggie Trees*; yet do they recompence it with the larger crop; the wood being tough, and the *Twigs* fit to bind strongly; the very peelings of the branches being useful to bind *Arbor-poling*, and in *Topiary works*, *Vineyards*, *Espalier-fruit*, and the like. There are two principal sorts of these *Withies*, the *hoary*, and the *red Withy* which is the *Greek*; toughest, and fittest to bind, whiles the *Twigs* are flexible and tender.

3. *Sallies* grow much faster, if they are Planted within reach of water, or in a very *Moorish* ground, or flat plain; and where the Soil is (by reason of extraordinary moisture) unfit for *Arable*, or *Meadow*; for in these cases it is an extraordinary improvement: In a word, where *Birch*, and *Alder* will thrive. Before you Plant them, it is found best to turn the ground with a *Spade*; especially, if you design them for a flat. We have three sorts of *Sallies* amongst us (which is one more than the *Antients* challeng'd, who

N

name

name onely the *Black*, and *White* which was their *Nitellina*) the *vulgar*, which proves best in dryer Banks, and the *hopping-Sallyes* which require a moister Soil, growing with incredible celerity : And a *third* kind, of a different colour from the other *two*, having the twigs *reddish*, the Leaf not so long, and of a more dusky *green*; more brittle whilst it is growing in *twigs*, and more tough when arriv'd to a competent size : All of them useful for the *Thatcher*.

4. Of *these*, the *hopping-Sallyes* are in greatest esteem, being of a clearer *terse* grain, and requiring a more *succulent* Soil; best planted a foot deep, and a foot and half above ground (though some will allow but a foot) for then every branch will prove excellent for future *setlings*. After *three* years growth (being cropped the second and third) the first years increate will be 'twixt *eight* and *twelve* foot long generally; the *third* years growth strong enough to make *Rakes*, and *Pike-staves*; and the *fourth* for M. *Blithes's* treading *Plow*, and other like *Utensils* of the *Husbandman*.

5. If ye Plant them at full height (as some do, at four years growth, setting them five, or six foot length, to avoid the biting of *Cattel*) they will be lesse useful for streight *staves*, and for *setlings*, and make lesse speed in their growth; yet this also is a considerable *improvement*.

6. These would require to be Planted at least five foot distance, (some set them as much more) and in the *Quincunx* order : If they affect the *Soil*, the *Leaf* will come large, half as broad as a Man's hand, and of a more vivid *green*, alwayes larger the first year than afterwards : Some Plant them sloping, and cross-wise like a *Hedge*, but this impedes their wonderful growth; and (though *Pliny* seems to commend it, teaching us how to *excorticate* some places of each *set*, for the sooner production of *shoots*) it is but a deceitful *Fence*, neither fit to keep out *Swine*, nor *Sheep*; and being set too near, inclining to one another, they soon destroy each other.

7. The worst *Sallyes* may be planted so neer yet, as to be instead of *Stakes* in a *Hedge*, and then their *Tops* will supply their dwarfishness; and to prevent *Hedge-breakers* many do thus Plant them; because, they cannot easily be pull'd up, after once they have struck root.

8. If some be permitted to wear their *Tops* five or six years, their *Palms* will be very ample, and yield the first, and most plentiful relief to *Bees*, even before our *Abricots* Blossom. The *hopping-Sallys* open, and yield their *Palms* before other *Sallys*, and when they are *blown* (which is about the exit of *May*, or sometimes *June*) the *Palms* (or *δισκαριον*, *frugiperda* as *Homer* terms them for their extreme levity) are four inches long, and full of a fine *lanuginous Cotton*: A poor Body might in an hours space, gather a pound or two of it, which resembling the finest *Silk*, might doubtlesse be converted to some profitable use by an ingenious *House-wife*, if gather'd
in

in calm *Evenings*, before the *Wind*, *Rain* and *Dew* impair them; I am of opinion, if it were dri'd with care, it might be fit for *Cushions*, and *Pillows* of *Chastity*, for such of old was the reputation of those *Trees*.

9. Of these *hopping Sallys*, after three years *Rooting*, each Plant will yield about a score of *Staves* of full eight foot in length, and so following, for use, as we noted above: Compute then how many fair *Pike-staves*, *Perches*, and other useful *Materials*, that will amount to in an *Acre*, if Planted at five foot interval: But a fat, and moist Soil, requires indeed more space than a lean or dryer; namely *six*, or *eight* foot distance.

10. You may Plant *setlings* of the very first years growth; but the *second* year they are better, and the *third* year better then the *second*; and the *fourth* as good as the *third*; especially, if they approach the *Water*. A bank at a foot distance from the *water*, is kinder for them then a *Bog*, or to be altogether *immers'd* in the *water*.

11. 'Tis good to new-mould them about the *Roots* every second or third year; but *Men* seldom take the pains. It seems that *Sallys* are more hardy then even *Willows* and *Oziers*, of which *Columella* takes as much care as of *Vines* themselves. But 'tis cheaper to supply the *vacuity* of such accidental decays by a new *Plantation*, then to be at the charge of *digging* about them three times a year, as that *Author* advises; seeing some of them will decay, whatever care be used.

12. *Sallys* may also be propagated like *Vines*, by *coubbing*, and bowing them in *Arches*, and covering some of their parts with mould, &c.

13. For *setlings*, those are to be preferr'd which grow neerest to the *Stock*, and so (consequently) those *worst*, which most approach the *Top*. They should be Planted in the first fair, and pleasant Weather in *February*, before they begin to *bud*; we about *London* begin at the latter end of *December*. They may be cut in *Spring* for *Fuel*, but best in *Autumn* for use; but in this work (as of *Poplar*) leave a *twig* or two; which being twitted *Arch-wise*, will produce plentiful *sprouts*, and suddenly furnish a *head*.

14. If in our *Coppes* one in four were a *Sally* set, amongst the rest of varieties, the profit would recompence the care.

15. The swift growing *Sally* is not so tough, and hardy for some uses as the *flower*, which makes *Stocks* for Gard'ners *Spades*; but the other are proper for *Rakes*, *Pikes*, *Mops*, &c. *Sally-Coal* is the soonest consum'd; but of all others the most accommodate for *Painters* to design their *Work*, and first draught on *Paper* with, &c. as being fine, and apt to slit into *Pencils*.

16. To conclude, there is a way of *Graffing* a *Sally* truncheon; take it of two foot and half long as big as your *wrist*; Graff at both ends a *Figure*, and *Mulberry* Cyon of a foot long, and so, without *claying*, set the *stock* so far into the ground as the *Plant* may be three or four inches above the *Earth*: This will thrive exceeding

ceedingly the *first* year, and in *three*, be fit to transplant. The Season for this Curiosity is *February*.

Oziers.

17. *Oziers* or the *Aquatic Salix*, are of innumerable kinds, commonly distinguish'd from *Sallyes*, as *Sallyes* are from *Withies*; being so much smaller then the *Sallyes*, and shorter liv'd, and requiring more constant *moisture*, yet would be Planted in rather a *dryish* ground, than over *moist* and spewing, which we frequently cut Trenches to avert: It likewise yields more limber, and flexible twigs for *Baskets*, *Flaskets*, *Hampers*, *Cages*, *Lattices*, *Cradles*, the Bodies of *Coaches*, and *Wagons*, for which 'tis of excellent use, light, durable, and neat, as it may be wrought and cover'd: For *Chairs*, *Hurdles*, *Staves*, *Bands*, &c. likewise for *Fish Wairs*, and to support the *Banks* of impetuous *Rivers*: In fine, for all *Wicker* and *Twiggie* Works:

Viminibus Salices——

18. But these sort of *Oziers* would be cut in the new *shoot*; for if they stand longer they become more inflexible; cut them close to the *head* (a foot or so above earth) about the beginning of *October*; unless you will attend till the *Cold* be past, which is better; and yet we about *London*, Cut them in the most piercing *Seasons*, and Plant them also till *Candlemas*, which those who do not observe, we Judge ill *Husbands*, as I learn from a very Experienc'd *Basket-maker*; and in the *decrease*, for the benefit of the *Workman*, though not altogether for *that* of the *Stock*, and succeeding *Shoot*: When they are cut, make them up into *bundles*, and give them shelter; but such as are for *White-work* (as they call it) being thus *fagotted*, and made up in *Bolts*, as the term is, severing each sort by themselves, should be set in *water*, the ends dipped; but for *black*, and *unpeel'd* preserv'd under Covert only, or in some *Vault* or *Cellar*, to keep them *fresh*, sprinkling them now and then in excessive hot Weather: The *peelings* of the former are for the use of the *Gard'ner*, and *Cooper*, or rather the *splittings*.

19. We have in *England* these three *vulgar* sorts; one of little worth, being brittle, and very much resembling the fore-mention'd *Sally*, with reddish twigs, and more greenish, and rounder Leaves: Another kind there is, call'd *Perch*, of limber and green twigs, having a very slender leaf; the *third* sort is totally like the *second*, onely the twigs are not altogether so green, but *yellowish*, and near the *Popinjay*: This is the very best for Use, tough, and hardy. But the most usual names by which *Basket makers* call them about *London*, and which are all of different *species*, therefore to be Planted separately, are, the *hard Gelfter*, the *Horfe Gelfter*, *Whyning*, or *shrivel'd Gelfter*, the *Black Gelfter*, in which *Suffolk* abounds. Then follow the *Golstones*, the *Hard* and the *Soft Golston* (brittle, and worst of all the *Golstones*) the sharp, and slender top'd *yellow Golston*; the fine *Golston*: Then is there the

Yellow

Yellow Ozier, the *Green-Ozier*, the *Snake* or *speckled Ozier*, *Swallow-tail*, and the *Spaniard* : To these we may add amongst the number of *Oziers* (for they are both govern'd and us'd alike) the *Flanders Willow*, which will arrive to be a large *Tree* as big as ones middle, the oftner cut the better : With these our *Coopers* tie their *Hoops*, to keep them bent. Lastly, the *white-Sallow*, which being of a Year or two growth, is us'd for *Green-work* ; and if of the toughest sort, to make *quarter-Can-hoops*, of which our *Seamen* provide great quantities, &c.

20. These choicer sorts of *Oziers*, which are ever the *smallest* ; also the *golden-yellow*, and *white*, which is preferr'd for propagation, and to breed of, should be Planted of *slips* of two, or three years growth a foot deep, and half a yard length, in *Moorish* ground, or *banks*, or else in *furrows* ; so that (as some direct) the *Roots* may frequently reach the *water* ; for *Fulminibus Salices* — though we commonly find it *rots* them, and therefore never choose to set them so deep as to sent it, and at three, or four foot distance.

21. The *Season* for *Planting* is *January*, and all *February*, though some not till mid-*February*, at two foot square ; but *Cattel* being excessively liquorish of their *leaves* and tender *buds*, some talk of a *grafting* them out of reach upon *Sallys*, and by *this*, to advance their sprouting ; but as the *work* would consume time, so have I never seen it succeed.

22. Some do also Plant *Oziers* in their *Eights* like *Quick-sets*, thick, and (neer the *water*) keep them not more than half a foot above ground ; but then they must be diligently cleans'd from *Moss*, *Slab*, and *Onze*, and frequently *prun'd* (especially the smaller *spires*) to form single shoots ; at least, that few, or none grow double : These, they *head* every second year about *September*, the *Autumnal* cuttings being best for use : But generally

23. You may cut *Willows*, *Sallys*, and *Willows*, at any mild and gentle *season* between *leaf* and *leaf*, even in *Winter* ; but the most congruous time both to *Plant*, and to *cut* them is *Crescente Luna Vere*, circa *calendas Martias* ; that is, about the new *Moons*, and first open weather of the early *Spring*.

24. It is in *France*, upon the *Loire*, where these *Eights* (as we call them) and Plantations of *Oziers* and *Willows* are perfectly understood ; and both *there*, and in divers other Countries beyond Seas, they raise them of the *Seeds*, contain'd in their *Juli* or *Catkins*, which they sow in *Furrows* or shallow *Trenches*, and it springs up like *Corn* in the *blade*, and come to be so tender and delicate, that they frequently mow them with a *Scyth* : This we have attempted in *England* too, even in the place where I live, but the obstinate, and unmerciful *Weed* did so confound them, that it was impossible to keep them clean with any ordinary *Industry*, and so they were given over : It seems either *weeds* grow not so fast in other Countries, or that the *People* (which I rather think) are more patient and laborious. The *Ozier* is of that *Emolument*,
that

that in some places I have heard *twenty-pounds* has been given for one *Acre*; *ten* is in this part an usual price; and doubtlesse, it is far preferrable to the best *Corn-land*; not onely for that it needs but *once Planting*, but because it yields a constant *Crop* and revenue to the Worlds end; and is therefore in esteem of knowing Persons, valu'd in *Purchase* accordingly; consider'd likewise, how easily 'tis renew'd, when a Plant now and then fails, by but pricking in a *twig* of the next at hand, when you vise to cut them: We have in this *Parish* where I dwell, improv'd Land from lesse than one pound, to neer *ten* pounds the *Acre*: And when we shall reflect upon the infinite quantities of them we yearly bring out of *France* and *Flanders*, to supply the extraordinary expence of *Basket-work*, &c. for the *Fruiterers*, *Lime-burners*, *Gardeners*, *Coopers*, *Packers* up of all sorts of *Ware*, and for general *Carriage*, which seldom last above a Journey or two; I greatly admire *Gentlemen* do no more think of employing their *moist grounds* (especially, where *Tides* near fresh *Rivers* are reciprocal) in Planting and propagating *Oziers*. To omit nothing of the *Culture* of this useful *Ozier*, *Pliny* would have the place to be prepar'd by *trenching* it a foot and half deep, and in *that*, to fix the *sets* or *cuttings* of the same length at six foot interval. These (if the sets be large) will come immediately to be *Trees*; which after the first three years, are to be abated within two foot of the ground. Then, in *April*, he advises to dig about them: Of these they formerly made *Vine-props*, and one *Acre* hath been known to yield *Props* sufficient to serve a *Vineyard* of twenty five *Acres*.

25. *John Tradescant* brought a small *Ozier* from *S.Omers* in *Flanders*, which makes incomparable *Net-work*, not much inferiour to the *Indian* twig or *bent-work*; which we have seen; but if we had them in greater abundance, we should haply want the *Artificers* who could imploy them.

Willow.

26. Our common *Salix* or *Willow*, is of two kinds, the *white* and the *black*: The *white* is also of two sorts, the one of a *yellowish*, the other of a *browner* Bark: The *black Willow* is Planted of *stakes* of three years growth, taken from the head of an *old Tree*, before it begins to sprout: Set them of six foot high, and ten distant. Those *Woody* sorts of *Willow* delight in *Meads* and *Ditch-sides*, rather *dry*, then over *wet* (for so they last longest) yet the *black* sort, and the *reddish* do sometimes well in more *boggie* grounds, and would be Planted of *Stakes* as big as on's *Leg*, cut as the other, at the length of five or six foot, and fix'd a foot or more into the earth; the *hole* made with an *Oken-stake* and beetle, or with an *Iron crow* (some use a long *Augur*) so as not to be forced in with too great violence: But first, the *Trunchions* should be a little slop'd at both extreams, and the biggest planted downwards: To this, if they are *soak'd* in *water* two or three dayes (after they have been siz'd for length, and the twigs cut off ere you plant them) it will be the better. Let this be done in *February*; the *mould* as well clos'd to them as possible, and treated as was taught in the *Poplar*. If you Plant

Plant for a kind of *Wood* or *Coppse* (for such I have seen) set them at six foot distance, or nearer, in the *Quincunx*, and be careful to take away all *Suckers* from them at three years end : You may abate the *head* half a foot from the *Trunk*, viz. three, or four of the lustiest *Shoots*, and the rest cut close, and *bare* them yearly, that the *three* or *four* you left, may enjoy all the *Sap*, and those which were spared, will be gallant *Pearches* within *two* years. Arms of four years growth will yield substantial *sets* to be Planted at eight, or ten foot distance; and for the first three years well defended from the *Cattel*, who infinitely delight in their *leaves*, green or wither'd. Thus, a *Willow* may continue *twenty*, or *five* and *twenty* years, with good profit to the industrious *Planter*, being *headed* every four or five years; some have been known to *shoot* no less than *twelve* foot in *one* year, after which the old, rotten *Dotards* may be *fell'd*, and easily suppli'd. But if you have ground fit for whole *Coppes* of this *wood*, cast it into double *Dikes*, making every *fosse* near three foot wide; two and half in depth; then leaving four foot at least of ground for the earth (because in such *Plantations* the moisture should be below the *Roots*, that they may rather see than feel the *Water*) and two *Tables* of *Sets* on each side, plant the *Ridges* of these *Banks* with but one single *Table*, longer, and bigger than the *Collateral*, viz. three, four, five or six foot high, and distant from each other about two yards. These *banks* being carefully kept *weeded* for the first two years, till the *Plants* have vanquish'd the *Grass*, and not cut till the *third*; then lop them *traverse*, and not obliquely, at *one* foot from the ground, or somewhat more, and he will *head* to admiration : But such which are cut at three foot height, are most durable, as least soft and *aquatic* : They may also be *Grafted* 'twixt the *Bark*, or *budded*; and then they become so beautifull, as to be fit for some kind of delightful *Walks*; and this I wish were practis'd among such as are seated in low, and Marshy places, not so friendly to other *Trees*. Every *Acre* at eleven, or twelve years growth, may yield you near an *hundred Load* of *Wood* : Cut them in the *Spring* for dressing; but in the *Fall* for *Timber* and *Fuel* : I have been inform'd, that a *Gentleman* in *Essex*, has lopp'd no less than 2000 yearly, all of his own planting. It is far the sweetest of all our *English Fuel*, provided it be sound and dry, and emitting little *Smoke* is the fittest for *Ladies Chambers*; and all those *Woods* and *Twiggs* would be cut either to *Plant*, *Work* with, or *Burn* in the dryest time of the day.

27. There is a sort of *Willow* of a slender and long Leaf, resembling the smaller *Ozier*; but rising to a Tree as big as the *Sally*, full of *knots*, and of a very brittle *spray*, onely here *rehears'd* to acknowledge the *variety*.

28. There is likewise the *Garden-willow*, which produces a sweet and beautiful *flower*, fit to be admitted into our *Hortulan ornaments*, and may be set for *partitions* of *squares*; but they have no affinity with other. There is also in *Shropshire* another very *odoriferous* kind.

29. What

29. What most of the former enumerated kinds differ from the *Sallys*, is indeed not much considerable, they being generally useful for the same purposes; as *Boxes*, such as *Apothecaries* and *Goldsmiths* use; for *Cart-Saddle-trees*, yea, *Gun-stocks*, and *Half-Pikes*, *Harrows*, *Shoos-makers Lasts*, *Heels*, *Clogs* for *Pattens*, *Forks*, *Rakes*, especially the *Tooths*, which should be wedg'd with *Oak*, but let them not be cut for this when the *Sap* is stirring, because they will shrink, *Pearches*, *Hop-poles*, *Ricing* of *Kidney-beans*, and for *Supporters* to *Vines*, when our *English Vineyards* come more in request: Also for *Hurdles*, *Sieves*, *Lattices*; for the *Turner*, *Kyele-pins*, great *Town-Topps*; for *Platters*, little *Cashes* and *Vessels*; especially to preserve *Verjuices* in the best of any: *Pailes* are also made of cleft *Willow*, *Dorfers*, *Fruit-baskets*, *Canns*, *Hives* for *Bees*, *Trenchers*, *Trays*, and for polishing and whetting *Table-Knives*, the *Butler* will find it above any *Wood* or *Whet-stone*; also for *Coals* and *Bavin*, not forgetting the fresh *boughs*, which of all the *Trees* in nature, yield the most chaste and coolest *Shade* in the hottest season of the day; and this *Umbrage* so wholesome, that *Physicians* prescribe it to *Feaverish* persons, permitting them to be plac'd even about their *Beds*, as a safe and comfortable *refrigerium*: The wood being preserv'd dry will dure a very long time; but that which is found wholly *putrifi'd*, and reduc'd to a loamy earth in the hollow trunks of *superannuated Trees*, is, of all other, the fittest to be mingl'd with fine *mould*, for the raising our choicest *Flowers*, such as *Anemonies*, *Ranunculus's*, *Auriculas*, and the like.

What would we more? low *Broom*, and *Sallys* wild,
Or feed the Flock, or Shepherds shade, or Field
Hedges about, or do us Hony yield.

*Quid majora sequor? Salicis, humilesque gemiflae,
Aut illa pecori frondem, aut pastoribus umbram
Sufficiunt, sepemque satis, & pabula nulli.*

Georg. 2.

30. Now by all these Plantations of the *Aquatic Trees*, it is evident, the *Lords* of *Moorish Commons*, and unprofitable *Wasts*, may learn some *Improvement*, and the neighbour *Bees* be gratified; and many *Tools* of *Husbandry* become much cheaper. I conclude, with the Learned *Stephanus's* note upon these kind of *Trees*, after he has enumerated the universal benefit of the *Salictum*: *Nullius enim tutior reditus, minorisve impendii, aut tempestatis securior.*

CHAP. XXI.

Of Fences, Quick-fets, &c.

i. **O**Ur main *Plantation* is now finish'd, and our *Forest* adorn'd with a just *variety* : But what is yet all this labour, but losse of *time*, and irreparable *expence*, unlesse our *young*, and (as yet) tender *Plants* be sufficiently guarded from all external *injuries* for, as old *Tusser*,

If Cattel, or Cony may enter to Crop,
Young Oak is in danger of losing his Top.

But with something a more polish'd *stile*, though to the same purpose, the best of Poets,

Plash Fences thy *Plantation* round about,
And whilst yet Young, be sure keep Cattel out ;
Severest Winters, scorching Sun infest. (lest;
And Sheep, Goats, Bullocks, all young Plants mo-
Yet neither Cold, nor the hoar rigid Frost,
Nor Heat reflecting from the Rocky Coast,
Like Cattel Trees, and tender Shoots confound,
When with invenom'd Teeth the twigs they

(wound.

*Texenda sepes etiam, & pecus omnis tenendum est :
Præcipue, dum frons tenera, imprudensque laborum
Cui, super indignas hyemes, solemque potentem,
Sylvestres Uri assidue, capreaque signaces
Illudunt : Pascuntur Oves, avidaque juvenæ,
Frigora nec tantum cana concreta pruina,
Aut gravis incumbens scopulis arenibus aestas,
Quantum illi nocere greges, durique venenum
Dentis, & adorso signata in stirpe cicatrix.*

Georg. 2.

2. For the *reason* that so many complain of the improsperous condition of their *Wood-lands*, and *Plantations* of this kind, proceeds from this *neglect*; though (*sheep* excepted) there is no employment whatsoever incident to the *Farmer*, which requires less *expence* to gratifie their expectations : One diligent, and skilful *Man* will govern *five hundred Acres* : But if through any accident a *Beast* shall break into his *Masters Field*; or the wicked *Hunters* make a Gap for his *Dogs* and *Horses*, what a clamor is there made for the disturbance of a years *Crop* at most in a little *Corn* ? whilst abandoning his young *Woods* all this time, and perhaps many years, to the venomous bitings and treading of *Cattel*, and other like injuries (for want of due care) the detriment is many times *irreparable* : Young *Trees* once cropp'd hardly ever *recovering* : It is the *bane* of all our most hopeful *Timber*.

3. But shall I provoke you by an *instance* ? A *Kins-man* of mine has a *Wood* of more than 60 years standing ; it was, before he purchas'd it, expos'd and abandon'd to the *Cattel* for divers years : some of the outward skirts were nothing save *shrubs* and miserable
O starvings ;

starvings; yet still the place had a disposition to grow *woody*; but by this neglect continually suppress'd. The industrious *Gentleman* has *Fenced* in some *Acres* of this, and cut all close to the ground; it is come in eight or nine years, to be better worth than the *Wood* of *sixty*; and will (in time) prove most incomparable *Timber*, whiles the other part so many years advanc'd, shall never recover; and all *this* from no other *cause*, than preserving it *fenc'd*: Judge then by *this*, how our *Woods* come to be so decried: Are five hundred *sheep* worthy the care of a *Shepherd*? and are not five thousand *Oaks* worth the *fencing*, and the inspection of a *Hayward*?

And shall men doubt to Plant, and careful be?

Et dabunt homines serere, atque impendere curam?

Georg. 2.

Let us therefore *shut* up what we have thus laboriously *Planted*, with some good *Quick-set* hedge. Which,

—All Countreys bear, in every ground
As Denizen, or Enter-loper found:
From Gardens and till'd fields expell'd, yet there
On the *extreams* stands up, and claims a share.
Nor *Massiff-dog*, nor *Pike-man* can be found
A better Fence to the enclosed Ground.
Such breed the rough and hardy *Cantons* rear,
And into all adjacent Lands prefer,
Tough rugged Churles; and for the Battel fit,
Who Courts and States with Complement or Wit
To civilize nor to instruct pretend;
But with stout faithful service to defend.
This *Tyrants* know full well, nor more confide
On *Guards* that serve lesse for Defence than Pride:
Their Persons safe they do not judge amiss,
And *Realms* committed to their *Guard* of *Swiss*.

—Omne solum natale est, intras ubique
Ardet; illa quidem cultis excluditur agris
Plerumque, atque hortis; sed circumsepit utrosque
Atque omnes adytus servat fidissima cullos,
Vilior latrante Canis, armatogue Priapo.
Aspera frigidibus saxisque Helvetia tales
Educat, & peregrin terras emittit in omnes
Enormes durisque viros, sed fortia bella
Pectora; non illi cultus, non moribus Auson,
Atque Urbes decorate valent, sed utraque fidei
Defendunt opera; nec iis, gens cauta, Tyranni,
Præponunt speciosa magis, multumque sonora
Præsidia; his certi vitam tutantur opesque, &c.

Coultii pl. l. 6.

For so the ingenious *Poet* has metamorphos'd him, and I could not withstand him.

Quick-sets.

4. The *Hei-thorne*, and indeed the very best of common *hedges*, is either rais'd of *Seeds* or *Plants*; but then it must not be with *despair*, because sometimes you do not see them peep the *first* year; for the *Haw*, and many other *Seeds*, being invested with a very hard *Integument*, will now and then suffer *imprisonment* two whole years under the earth; and impatience of this does often frustrate the expectation of the *resurrection* of divers *seeds* of this nature; so as we frequently *dig* up, and disturb the *beds* where they have been *sown*, in *despair*, before they have gone their *full time*; which is also the reason of a very popular mistake in other *Seeds*: Especially, that of the *Holly*, concerning which there goes a *tradition*; that they will not sprout till they be pass'd through the *Maw* of a *Thrush*; whence the saying, *Turdus exitium suum cacat* (alluding to the *Viscus* made thereof, not the *Mistletoe* of *Oak*) but this is an *error*, as I am able to testify on *experience*; they come up very well of the *Berries*, and with *patience*; for (as I affirm'd) they will *sleep* sometimes two entire years in their *Graves*; as will also the

the seeds of *Yew*, *Sloes*, *Phillyrea angustifolia*, and sundry others, whose shells are very hard about the small kernels; but which is wonderfully facilitated, by being (as we directed) prepar'd in beds, and Magazines of Earth or Sand for a competent time, and then committed to the ground before the full in March, by which season they will be chitting, and speedily take Root: Others bury them deep in the ground all Winter, and sow them in February: And thus I have been told of a Gentleman who has considerably improv'd his Revenue, by sowing Haws only, and raising Nurseries of Quick-sets, which he sells by the hundred far and near: This is a commendable industry; any neglected corners of ground will fit this Plantation.

5. But *Columella* has another expedient for the raising of our *spinetum*, by rubbing the now mature Hips and Haws into the crevices of Bass ropes, and then burying them in a Trench: Whether way you attempt it, they must (so soon as they peep, and as long as they require it) be sedulously cleans'd of the weeds, which, if in beds for transplantation, had need be at the least three or four year; by which time even your seedlings will be of stature fit to remove; for I do by no means approve of the vulgar premature Planting of Sets, as is generally us'd throughout England; which is to take such only as are the very smallest, and so to crowd them into three or four files, which are both egregious mistakes.

6. Whereas it is found by constant experience, that Plants as big as ones thumb, set in the posture, and at the distance which we spake of in the Horn-beam; that is, almost perpendicular (not altogether, because the Rain should not get in-twixt the Rind and wood) and single, or at most not exceeding a double row, do prosper infinitely, and much out-strip the densest, and closest ranges of our trifling Sets, which make but weak shoots, and whose roots do but hinder each other, and for being couch'd in that posture on the sides of Banks and Fences (especially where the earth is not very tenacious) are bared of the mould which should entertain them, by that time the Rains and Storms of one Winter, have passed over them. In Holland, and Flanders (where they have the goodliest Hedges of this kind about the Counter-scarps of their invincible fortifications, to the great security of their Musketers upon occasion) they Plant them according to my description, and raise Fences so speedily, and so impenetrable, that our best are not to enter into the comparison. - Yet, that I may not be wanting to direct such as either affect the other way, or whose Grounds may require some Bank of Earth, as ordinarily the verges of Coppes, and other Inclosures do: You shall by line cast up your fosse of about three foot broad, and about the same depth, provided your mould hold it; beginning first to turn the turf, upon which, be careful to lay some of the best Earth to bed your Quick in, and there lay, or set the Plants; two in a foot space is sufficient; being diligent to procure such as are fresh gathered, straight, smooth, and well rooted; adding now and then, at equal spaces of twenty or thirty foot, a young

Oakling or *Elme-sucker*, *Ash* or the like, which will come in time to be ornamental *Standards*, and good *Timber*: If you will needs multiply your rowes, a *foot* or somewhat lesse: Above that, upon more congested mould, plant another ranke of *sets*, so as to point just in the middle of the *vacuities* of the *first*, which I conceive enough: This is but for the single *Fosse*; but if you would fortifie it to the purpose, do as much on the other side, of the same *depth*, *height*, and *planting*; and then last of all, cap the top in *Pyramis* with the worst, or bottom of the *Ditch*: Some, if the *mould* be good, plant a row or two on the *Edge*, or very *crest* of the *mound*, which ought to be a little flatned: Here also many set their *dry-Hedge*, to defend, and shade their under-plantation, and I cannot reprove it: But great care is to be had in this *work*, that the main bank be well *footed*, and not made with too suddain a declivity, which is subject to fall-in after *frosts* and *wet* weather; and this is good husbandry for *moyst* grounds; but where the Land lyes *high*, and is hot and *gravelly*, I prefer the lower fencing; which, though *even* with the *area* it self, may be protected with *stakes* and a dry hedge, the distance competent, and to very good purposes of educating more frequent *Timber* amongst the rowes.

8. Your *Hedge* being yet *Young*, should be constantly *weeded*, (of *Brambles* especially, the great *Dock*, and *Thistle*, &c.) though some admit not of this work after *Michaelmas*, for *Reasons* that I approve not: It has been the practice of *Herefordshire*, in the plantation of *Quick-set hedges*, to plant a *Crab-stock* at every twenty-foot distance: and this they observe so *Religiously*, as if they had been under some rigorous *Statute* requiring it: But by this means, they were provided in a short time with all advantages for the *grafting* of *Fruit* amongst them, which does highly recompense their industry. Some cut their *Sets* at *three* years growth even to the very ground, and find that in a *year* or *two*, it will have shot, as much as in *seven*, had it been let alone.

9. When your *Hedge* is now neer six years stature, *plash* it about *February* or *October*; but this is the work of a very dextrous and skilful *Husbandman*; and for which our honest Country-man *M. Markam* gives excellent directions; only I approve not so well of his *deep cutting*, if it be possible to bend it, having suffered in some thing of that kind: It is almost incredible to what perfection some have laid these *Hedges*, by the rural way of *plashing*, better than by *clipping*; yet may both be used for *ornament*, as where they are planted about our *Garden-fences*, and *fields* neer the *Mansion*. In *Scotland*, by tying the young *shoots* with *bands* of *hay*, they make the *stems* grow so very close together, as that it encloseth *Rabbets* in *Warrens* instead of *pales*.

10. And now since I did mention it, and that most I find do greatly affect the vulgar way of *Quickening* (that this our *Discourse* be in nothing deficient) we will in brief give it you again after *Geo. Markams* description, because it is the best and most accurate, although much resembling our former *direction*, of which it seems but

but a *Repetition*, 'till he comes to the *plashing*. In a Ground which is more *dry* then *wet* (for *watry* places it abhors) plant your *Quick* thus: Let the first row of *Sets* be placed in a *trench* of about half a foot deep, *even* with the top of your *ditch*, in somewhat a *sloping*, or *inclining* posture: Then, having rais'd your *bank* near a foot upon them, plant another *row*, so as their tops may just peep out over the middle of the *spaces* of your *first* row: These cover'd again to the height or thickness of the other, place a third *rank* opposite to the *first*, and then finish your bank to its intended height. The distances of the *plants* would not be above one *foot*; and the *season* to do the work in, may be from the entry of *February*, till the end of *March*; or else in *September*, to the beginning of *December*. When this is finish'd, you must guard both the top of your *Bank*, and outmost verge of your *Ditch*, with a sufficient *dry-hedge* interwoven from *stake* to *stake* into the earth (which commonly they do on the bank) to secure your *Quick* from the spoil of *Cattle*. And then being careful to repair such as decay, or do not spring, by suppling the dead, and trimming the rest; you shall after three *years* growth, sprinkle some *Timber-trees* amongst them; such as *Oak*, *Beech*, *Ash*, *Maple*, *Fruit*, or the like; which being drawn young out of your *Nurseries*, may be very easily inserted. But that which we affirm'd to require the greatest dexterity in this work, is, the artificial *plashing* of our *Hedge* when it is now arriv'd to a *six* or *seven* years head; though some stay till the *tenth* or longer. In *February* therefore, or *October*, with a very sharp *hand-bill* cut away all superfluous *sprays* and *straglers* which may hinder your progress, and are useless. Then, searching out the principal *stems*, with a keen and light *Hatchet*, cut them *slant-wise* close to the *Ground*, about three quarters through, or rather, so far onely, as till you can make them comply handsomely, which is your best direction, and so lay it from you *sloping* as you go, folding in the lesser *branches* which spring from them; and ever within a five, or six foot distance, where you find an upright *set* (cutting off only the top to the height of your intended *hedge*) let it stand as a *stake* to fortifie your work, and to receive the *twinnings* of those *branches* about it. Lastly, at the *top* (which would be about *five* foot above ground) take the longest, most slender and flexible *twigs* which you reserv'd (and being cut as the former where need requires) bind in the extremities of all the rest, and thus your work is finish'd: This being done very close, and thick, makes an impregnable *Hedge*, in few years; for it may be repeated as you see occasion; and what you so cut away; will help to make your *dry-hedges* for your young *Plantations*, or be profitable for the *Oven*, and make good *Bavin*. For *stakes* in this work, *Oake* is to be preferr'd, though some will use *Elder*, or the *Black-Thorn* droven well in at every *yard* of interval; and even your *plash'd-hedges* need some small *thorns* to be lay'd over to protect the *spring* from *Cattel* and *Sheep*, 'till they are somewhat fortified; and the doubler the *winding* is lodg'd, the better; which should be beaten, and forced down

down together with the *stakes*, as equally as may be. Note, that in sloping your *Windings*, if it be too low done (as very usually) it frequently mortifies the tops; therefore, it ought to be so bent, as it may not impead the mounting of the *Sap*: If the *plash* be of a great, and extraordinary age, wind it at the neather boughs all together, and cutting the *sets* as directed, permit it rather to hang downwards a little, than rise too forwards; and then twist the branches into the work, leaving a set free and unconstrain'd at every yard space; besides such as will serve for *stakes*, abated to about five-foot-length (which is a competent stature for an *Hedge*) and so let it stand. One shall often find in this work, especially in *Old neglected Hedges*, some great *Trees*, or *stubs*, that commonly make gaps for *Cattel*: Such, should be cut so neer the Earth, as 'till you can lay them thwart, that the top of one, may rest on the root, or *stub* of the other, as far as they extend, stopping the cavities with its boughs and branches; and thus *Hedges* which seem to consist but onely of *Scrubby-Trees* and *stumps*, may be reduced to a tolerable *Fence*. We have been the longer on these descriptions, because it is of main importance, and that so few *Husband-men* are perfectly skil'd in it.

10. The *Roots* of an *Old Thorne* is excellent both for *Boxes* and *Corbs*, and is curiously and naturally wrought: I have read, that they made *ribs* to some small *Boates* or *Vessels* with the *White-Thorn*. The *Black-Crab* rightly season'd and treated, is famous for *Walking-staves*, and if over-grown us'd in *Mill-work*. Here we owe due *Elogy* to the Industry of that honourable Person my Lord *Ashley*, who has taught us to make such Enclosures of *Crab-stock*, onely, planted close to one another, as there is nothing more impregnable and becoming; or you may sow *Sider-kernels* in a *rill*, and fence it for a while with a double *dry Hedge*, not onely for a suddain and beautiful, but a very profitable *Inclosure*; because, amongst other benefits, they will yield you *Sider-fruit* in abundance: But in *Devonshire*, they build two *walls* with their *stones*, setting them edge-ways, two, and then one between; and so as it rises, fill the intervall or *Coser* with Earth (the *breadth* and *height* as you please) and continuing the *stone work*, and *filling*, and as you work beating in the *stones* flat to the sides, which causes them to stick everlastingly: This is absolutely the neatest, most saving, and profitable *Fencing* imaginable, where *flaty stones* are in any abundance; and it becomes not onely the most secure to the *Lands*, but the best for *Cattel* to lye warme under the *Walls*; when other *Hedges*, (be they never so thick) admit of some cold *winds* in Winter time that the leaves are of: Upon these *Banks* they plant not onely *Quick-sets*, but even *Timber-Trees* which exceedingly thrive, being out of all danger.

11. The *Pyracanth*, *Palinurus*, and like pretiofer sorts of *Thorne* might easily be propagated into plenty sufficient to store even these vulgar *Uses* were *Men* industrious; and then how beautiful, and sweet would the *environs* of our *Fields* be? for there are none of the *spinous shrubs* more hardy, nor fitter for our defence.

Thus

Thus might *Berberies* now and then be also inserted among our *hedges*, which, with the *Hips*, *Haws*, and *Cornel-berries*, do well in *light lands*, and would rather be planted to the *South* than *North* or *West*, as usually we observe them.

13. Some (as we noted) mingle their very *hedges* with *Oak-lings*, *Ash*, and *Fruit trees* sown, or planted, and 'tis a laudable improvement; though others do rather recommend to us *Sets* of all one sort, and will not so much as admit of the *Black-Thorne* to be mingled with the *White*, because of their unequal progress; and indeed, *Timber-trees* set in the *Hedge* (though *contemporaries* with it) do frequently wear it out; and therefore I should rather encourage such *Plantations* to be at some *Tards* neer the *Verges*, than perpendicularly in them.

14. In *Cornwall* they secure their *Lands* and *Woods* with high *Mounds*, and on them they plant *Acorns*, whose roots bind in the looser mould, and so form a double, and most durable *Fence*, incircling the *Fields* with a *Coronet* of *Trees*. They do likewise (and that with great commendation) make *hedges* of our *Genista Spinosia*, prickly *Furzes*, of which they have a taller sort, such as the *French* employ for the same purpose in *Bretaigne*, where they are incomparable *husbands*.

15. It is to be *sown* (which is best) or *planted* of the *roots* in a furrow: If sown, *weeded* till it be strong: both *Tonsile*, and to be diligently *clip'd*, which will render it very thick, an excellent and beautiful *hedge*: Otherwise permitted to grow at large, 'twill yield very good *Fagot*: It is likewise admirable *Covert* for *wild-fowle*, and will be made to grow even in *moyst*, as well as *dry* places: The young, and tender tops of *Furzes*, being a little *bruise'd*, and given to a lean sickly *Horse*, will strangely recover and plump him. Thus, in some places, they *sow* in *barren grounds* (when they lay them down) the last *crop* with this *seed*, and so let them remain till they break them up again, and during that interim, reap considerable advantage: Would you believe (writes a worthy *Correspondent* of mine) that in *Herefordshire* (famous for plenty of *wood*) their *Thickets* of *Furzes* (*viz.* the *vulgar*) should yield them more *profit*, than a like quantity of the best *Wheat* land of *England*? for such is theirs; if this be question'd, the *Scene* is within a mile of *Hereford*, and proved by *anniversary* experience, in the *Lands*, as I take it, of a *Gentleman* who is now one of the *Burgesses* for that *City*. And in *Devonshire* (the *seat* of the best *Husbands* in the *World*) they *sow* on their worst *Land* (well *plow'd*) the *seeds* of the rankest *Furzes*, which in four or five years becomes a rich *Wood*: no provender (as we say) makes *Horses* so hardy, as the young *tops* of these *Furzes*; no other *Wood* so thick, nor more excellent *Fuel*; and for some purposes also, yielding them a kind of *Timber* to their more humble *buildings*, and a great refuge for *Fowl* and other *Game*: I am assur'd, in *Bretaigne* 'tis sometimes sown no less than *twelve yards* thick, for a speedy, profitable, and impenetrable *Mound*: If we imitated this *husbandry* in the barren places

places of *Surrey*, and other parts of this *Nation*, we might exceedingly spare our *woods*; and I have bought the best sort of *French seed* at the shops in *London*. It seems that in the more *Eastern* parts of *Germany*, and especially in *Poland*, this vulgar trifle, and even our common *Broom* is so rare, that they have desired the *seeds* of them out of *England*, and preserve them with extraordinary care in their best *Gardens*; this I learn out of our *Johnsons Herbal*; by which we may consider, that what is reputed a *curse* and a *cumber* in some places, is esteem'd the ornament and blessing of another: But we shall not need go so far for this, since both *Beech* and *Birch* are almost as great strangers in many parts of this *Nation*, particularly *Northampton* and *Oxfordshire*.

Broom.

15. This puts me in mind of the *Broom*; another improvement for *Barren* grounds, and savor of more substantial *Fuel*: It may be sown *English*, or (what is more sweet, and beautiful) the *Spanish*, with equal success. In the *Western* parts of *France*, and *Cornwall*, it grows with us to an incredible height (however our *Poet* give it the epithete of *humilis*) and so it seems they had it of old, as appears by *Gratius* his *Genista Altinates*, with which (as he affirms) they us'd to make *staves* for their *Spears*, and hunting *Darts*.

Elder.

16. Lastly, a considerable *Fence* may be made of the *Elder*, set of reasonable lusty *trunchions*; much like the *Willow*, and (as I have seen them maintain'd) laid with great curiosity, and far excelling those extravagant plantations of them about *London*, where the *lops* are permitted to grow without due and skilful laying. There is a sort of *Elder* which has hardly any *Pith*; this makes exceeding stout *Fences*, and the *Timber* very useful for *Cogs* of *Mills*, *Butchers skewers*, and such tough employments. Old trees do in time become firm, and close up the *hollowness* to an almost invisible *pith*. But if the *Medicinal* properties of the *Leaves*, *Bark*, *Berries*, &c. were thoroughly known, I cannot tell what our *Country-man* could aile for which he might not fetch a *Remedy* from every *Hedge*, either for *Sickness* or *Wound*: The inner *Barke* of *Elder*, or, in leason, the *Buds*, boyld in *Water* grewel for a *Break-fast*, has effected wonders in the *Feaver*; and the decoction is admirable to assuage *Inflammations* and *tetrous* humors, and especially the *Scorbut*: But an *Extract* or *Therica* may be compos'd of the *Berries*, which is not onely efficacious to erradicate this *Epidemical* inconvenience, and greatly to assist *Longevity* (for famous is the story of *Neander*) but is a kind of *Catholicon* against all *Infirmities* whatever: The *Water* of the leaves and *Berries* are approved in the *Dropsy*, every part of the *Tree* is useful: The *Oyntment* made with the young *buds* and *leaves* in *May* with *Butter*, is most soveraine for *Aches*, shrunk *sinners*, &c. And lesse than this could I not say (with the leave of the charitable *Physitian*) to gratifie our poor *Wood-man*; and yet when I have say'd all this, I do by no means commend the *scent* of it, which is very noxious to the *Ayre*, and therefore, though I do not undertake that all things which sweeten the *Ayre* are salubrious, nor all ill favors pernicious; yet, as not for its beauty, so
neither

neither for its smell, would I plant *Elder* or much *Box* neer my Habitation: The *Elder* does likewise produce a certain green *Fly*, almost invisible, which is exceedingly troublesome, and whose sting is plainly venomous, smarts vehemently, and gathers a fiery redness where it attacks.

19. There is a *Shrub* call'd the *Spindle-Tree*, *Evonymus* or *Fusca-
num*, commonly growing in our *Hedges*, which bears a very hard *wood*, of which they sometimes made *Bowes* for *Viols*, and the *In-
layer* us'd it for its colour, and *Instrument-makers* for *Toothing* of *Organs* and *Virginal-keys*, *Tooth-pickers*, &c. What we else do with it I know not, save that, according with its name abroad, they make *spindles* with it. Here might come in (or be nam'd at least) the *Wild-Cornel*, good to make *Mill-Cogs*, *Pestles*, *Bobins* for *Bonelace*, &c. *Cornel*. Lastly, the *Fiburnum*, or *Way-faring tree*, growing also plentifully in every corner, makes the most plyant and best *bands* to *Fagot* with.

20. The *American Tucca* is a *hardier* plant than we take it to be; for it will suffer our sharpest *Winter*, as I have seen by experience, without that trouble, and care of setting it in *Cases* in our *Conservatories* for *hyemation*; such as have beheld it in *Flower* (which is not indeed till it be of some age) must needs admire the beauty of it; and it being easily multiplied, why should it not make one of the best, and most ornamental *Fences* in the world for our *Gardens*, with its natural *palisados*, as well as the more tender, and impatient of moisture the *Aloes* does for their *Vineyards* in *Languedoc*, &c. but We believe nothing *improvable*, save what our *Grand fathers* taught us. Finally, let trial likewise be made of that *Thorn* mention'd by *Cap. Liggon* in his *History* of *Barbados*; whether it would not be made grow amongst us, and prove as convenient for *fences* as *there*; the *Seeds* or *Sets* transported to us with due care. And thus, having accomplish'd what (by your *Com-
mands*) I had to offer concerning the *propagation* of the more *So-
lid*, *Material*, and useful *Trees*, as well the *Dry*, as *Aquatical*; and to the best of my *talent* fenc'd our *Plantation* in, I should here *con-
clude*, and set a *bound* likewise to my *Discourse*, by making an *Apolo-
gie* for the many *errours* and *impertinencies* of it; did not the *zeal*, and *ambition* of this *Illustrious Society* to promote and improve all *Attempts* which may concern the *Publick utility* or *Ornament*, per-
swade Me, that what I am adding for the farther encouragement to the *planting* of some other *useful* (though less *Vulgar*) *Trees*, will at least obtain your *pardon*, if it miss of your *Approbation*.

21. To discourse in this *stile* of all such *Fruit-trees* as would *Fruit-Trees* prove of greatest *emolument* to the whole *Nation*, were to design a just *Volume*; and there are *directions* already so many, and so accurately deliver'd and *publish'd* (but which cannot be affirm'd of any of the former *Classes* of *Forest-trees* and other remarks, at the least to my poor knowledge and research) that it would be need-
less to *Repeat*.

22. I do only wish (upon the prospect, and meditation of the universal *Benefit*) that every *person* whatsoever, worth *ten pounds*

per annum, within his *Majesties* Dominions, were by some indispensable *Statute* oblig'd to plant his *Hedg-rows* with the best, and most useful kinds of them; especially, in such places of the *Nation*, as being the more in-land *Counties*, and remote from the *Seas* and *Navigable Rivers*, might the better be excus'd from the planting of *Timber*, to the proportion of those who are more happily and commodiously situated for the transportation of it.

22. Undoubtedly, if this course were taken effectually, a very considerable part both of the *Meat* and *Drink* which is spent to our prejudice, might be saved by the *Country-people*, even out of the *Hedges* and *Mounds*, which would afford them not only the pleasure and profit of their delicious *Fruit*, but such abundance of *Sider* and *Perry*, as should suffice them to drink of one of the most wholesome and excellent *Beverages* in the *World*. Old Gerard did long since alledge us an example worthy to be pursu'd; *I have seen* (saith he, speaking of *Apple-Trees*, lib. 3. cap. 101.) *in the Pastures and Hedg-rows about the Grounds of a Worshipful Gentleman dwelling two miles from Hereford, call'd Mr. Roger Bodnome, so many Trees of all sorts, that the Servants drink for the most part no other drink but that which is made of Apples: The quantity is such, that by the report of the Gentleman himself, the Parson bath for Tythe many Hogs-heads of Sider: The Hogs are fed with the fallings of them, which are so many, that they make choice of those Apples they do eat, who will not taste of any but of the best. An Example doubtless to be followed of Gentlemen that have Land and Living; but Envy saith, The Poor will break down our Hedges, and we shall have the least part of the Fruit; but forward in the Name of God, Graff, Set, Plant, and nourish up Trees in every corner of your Ground; the labour is small, the cost is nothing, the commodity is great; your selves shall have plenty, the poor shall have somewhat in time of want to relieve their necessity, and God shall reward your good minds and diligence.* Thus saith honest Gerard. And in truth, with how small a charge, and infinite pleasure this were to be effected, every one that is *Patron* of a little *Nursery* can easily calculate: But by this *Expedient*, many thousands of *Acres*, sow'd now yearly with *Barley*, might be cultivated for *Wheat*, or converted into *Pasture* to the increase of *Corn*, and *Cattel*: Besides, the *Timber* which the *Pear-tree*, *Black-Cherry* afford, and many thorny *plums* (which are best for grain, colour and glosse) afford, comparable (for divers curious *Uses*) with any we have enumerated. The *Black-Cherry-Wood* grows sometimes to that bulke, as is fit to make *stooles* with, *Cabinets*, *Tables*, especially the redder sort, which will polish well; also *Pipes*, and *Musical Instruments*, the very bark employ'd for *Bee-Hyves*: But of this I am to render a more ample *Accompt* in the *Appendix* to this *Discourse*. I would farther recommend the more frequent planting, and propagation of *Fir*, *Pine-trees*, and some other beneficial *Materials* both for *Ornament* and profit; especially, since we find by experience, they thrive so well, where they are cultivated for *Curiosity* only.

CHAP. XXII.

Of the Fir, Pine, Pinafter, Pitch-tree, &c.

1. **A** *Bies, Pinus, Pinafter, Picea, &c.* are all of them easily rais'd of the *Kernels*, and *Nuts*, which may be gotten out of their *Cones* and *Clogs*, by exposing them a little before the *fire*, or in *warm water*, till they begin to gape, and are ready to deliver themselves of their numerous burthen.

2. There are of the *Fir* two principal *species*; the *Male* which is the bigger Tree most beautiful and tapering, and of a harder wood; the *Female*, which is much the softer, and whiter. Though *Whitenesse* be not the best *character*; that which knowing *Workmen* call the *Dram*, and that comes to us from *Bergen, Swinsound, Mossé, Longlound, Dranton, &c.* long, strait, clear, and of a yellow more *Cedrie* colour, is esteemed much before the *White* for *flooring* and *wainscot*; For *Masts*, &c. Those of *Prussia*, which we call *Spruse*, and *Norway* (especially from *Gottenberg*) are the best; unlesse we had more commerce of them from our *Plantations* in *New-England*, which are preferable to any of them. In the *Scottish High-lands* are *Trees* of wonderful altitude (though not altogether so tall, thick and fine as the former) which grow upon places so unaccessable, and far from the *Sea*, that (as one says) they seem to be planted of *God* on purpose for *Nurseries* of *Seed*, and monitors to our *Industry*, reserved with other *Blessings*, to be discover'd in our days amongst the new-invented *Improvements* of *Husbandry*, not known to our *Southern* people of this *Nation*, &c. Did we consider the pains they take to bring them out of the *Alps*, we should lesse stick at the difficulty of transporting them from the utmost parts of *Scotland*. To the former sorts we may add the *Esterrund Firs, Tonsberry, Fredrickstad, Hellerone, Holmstrand, Landiser, Stavenger, Lawrwat, &c.* They may be sown in *beds*, or *cassés*, at any time during *March*; and when they peep, carefully defended with *Furzes*, or the like *fence*, from the rapacious *birds*, which are very apt to pull them up, by taking hold of that little *infecund* part of the *seed*, which they commonly bear upon their tops: The *Beds* wherein you sow them had need be shelter'd from the *Southern Aspects* with some *skreen* of *Reed*, or thick *hedge*: Sow them in shallow *rills*, not above half-inch-deep, and cover them with fine light mould: Being risen a finger in height, establish their weak *stalks*, by sieving some more earth about them; especially the *Pines*, which being more *top-heavy*, are more apt to swag. When

they are of two, or three years growth, you may *transplant* them where you please; and when they have gotten good root, they will make prodigious shoots; but not for the three, or four first years comparatively. They will grow both in moist, or barren *Gravel*, and poor ground, so it be not over *sandy* and light; but before sowing (I mean *here* for large designs) turn it up a foot deep, sowing or setting your *Seeds* an hand distance, and riddle Earth upon them; In five or six weeks they will peep: When you *transplant*, water them well before, and cut the *clod* out about the *root* as you do *Melons* out of the *Hot-bed*, which knead close to them like an *Egg*: Thus they may be sent safely many *miles*, but the *top* must neither be bruised, much less cut, which would *dwarfe* it for ever.

3. The best time to transplant, were in the beginning of *April*; they would thrive mainly in a stiff hungry *Clay*; but by no means in over light, or rich *Soyle*: Fill the holes therefore with such barren *Earth*, if your ground be improper of it self; and if the *Clay* be too stiff and untractable, with a little *sand*, removing with as much *Earth* about the *roots* as is possible, though the *Fir* will better endure a naked *transplantation*, than the *Pine*: You may likewise *sow* in such earth about *February*, they will make a shoot the very first year of an *Inch*; next an handful, the third year three foot, and thence forward, above a yard annually. A Northern Gentleman, who has oblig'd me with this *proceſſe* upon his great Experience, assures me, that there are trees planted in *Northumberland*, which are in few years grown to the magnitude of *Ship-masts*; and from all has been sayd, deduces these *Incouragements*; 1. The facility of their *propagation*, 2. The nature of their growth, which is to affect places where nothing else will thrive: 3. Their *uniformity* and beauty, 4. Their perpetual *Verdure*; 5. Their *sweetnesse*, 6. Their *Fruitfulness*, affording *seed*, *gum*, *fuel*, and *timber* of all other woods the most useful and easy to *work*, &c. All which highly recommend it as an excellent *Improvement* of *Husbandry*, fit to be enjoyn'd by some solemn *Edict* to the *Inhabitants* of this our *Island*, that we may have *masts*, and those other *materials* of our own growth.

Pines.

4. The *Pine* (of which are reckon'd no less than ten several sorts, preferring the *Domestic* or *Sative* for the fuller growth) is likewise of both *Sexes*, whereof the *Male* growing lower, hath its wood more knotty and rude than the *Female*. They would be gather'd in *June*, before they gape, yet having hung two years (for there will be always some *ripe*, and some *green* on the same *Tree*) preserve them in their *nuts*, in *sand*, as you treat *Akorns*, &c. till the season invite, and then *set*, or *sow* them in *Ground* which is cultivated like the *Fir*, in most respects; only you may bury the *Nuts* a little deeper. By a friend of mine they were rolled in a fine *compost* made of *Sheeps-dung*, and scatter'd in *February*, and this way never fail'd *Fir* and *Pine*; they came to be above *Inch* high by *May*; and a *Spanish Author* tells us, that *macerated* five days in a *childs urine*, and three days in *water*, is of wonderful effect; This were

were an expeditious *proceſſe* for great *Plantations*; unleſs you would rather ſet the *Pine* as they do *Peaſe*; but at wider diſtances, that when there is occaſion of removal, they might be taken up with *earth* and all, I ſay, *taken up*, and not remov'd by *Evulſion*; becauſe they are (of all other *Trees*) the moſt obnoxious to miſcarry without this caution; and therefore it were much better (where the *Nuts* might be commodiouſly ſet, and defended) never to remove them at all, it gives this *Tree* ſo conſiderable a check. The ſafeſt courſe of all, were to ſet the *Nuts* in an *Earthen-pot*, and in froſty weather, ſhewing it a little to the *fire*, the intire *Clod* will come out with them, which are to be reſerved, and ſet in the *naked Earth*, in convenient and fit *holes*, ſo ſoon as the *thaw* is univerſal: Some commend the ſtrewing a few *Oats* at the bottom of the *fosſes* or *pits* in which you tranſplant the *naked roots*, for a great promovement of their taking; and that it will cauſe them to ſhoot more in *one year* than in *three*; but to this I have already ſpoke.

5. I am aſſur'd (by a perſon moſt worthy of credit) that in the *Territory* of *Alzey* (a Country in *Germany*, where they were miſerably diſtreſſed for *Wood*, which they had ſo deſtroy'd as that they were reduced to make uſe of *Straw* for their beſt *Fuel*) a very large *Tract* being newly plowed, but the *Warrs* ſurprizing them, not ſuffer'd to ſow, there ſprung up the next year a whole *Forest* of *Pine-trees*, of which ſort of *Wood* there was none at all within leſſe then *fourſcore miles*; ſo as 'tis verily conjectur'd by ſome, they might be waſted thither from the Country of *Weſtraſia*, which is the neereſt part to that where they grow: If this be true, we are no more to wonder, how, when our *Oak woods* are grubb'd up, *Beech*, and *Trees* of other *kinds*, have frequently ſucceeded them: What ſome impetuous *Winds* have done in this nature, I could produce inſtances almoſt *miraculous*: I ſhall ſay nothing of the opinion of our Maſter *Varro*, and the learned *Theophraſtus*, who were both of a faith, that the *ſeeds* of *Plants* drop'd out of the *Air*: *Pliny* in his 16. *Book*, *Chap.* 33. upon diſcourſe of the *Cretan Cypreſs*, attributes much to the *indoles* and nature of the *ſoil*, *virtue* of the *Climate*, and *Impreſſions* of the *Air*: And indeed it is very ſtrange, what is affirm'd of that *Pitchy-rain*, reported to have fallen about *Cyrene*, the year 430. *U. C.* after which, in a ſhort time, ſprung up a whole *wood* of the *Trees* of *Laſer-pitium*, producing a precious *Gum* not much inferiour to *Benzoiv*, if at leaſt the *ſtory* be warrantable: But of theſe *Aerial irradiations*, various *conceptions*, and *equivocal productions* without *ſeed*, &c. upon another occaſion, if life and leiſure permit me to finiſh what has been long under the hand and file, to gratifie our *Horticultores*; this preſent *Treatiſe* being but an imperfect *limb* of that more ample *Work*.

6. In tranſplanting of theſe *Coniferous Trees*, which are generally *Reſinaceous*, viz. *Fir*, *Pine*, *Larix*, *Cedar*, and which have but thin and ſingle *Roots*, you muſt never diminifh their *heads*, nor be at all buſie with their *roots*, which pierce deep, and is all their foundation, unleſs

less you find any of them bruised, or much broken, therefore such down-right *Roots* as you may be forc'd to cut off, it were safe to *sear* with an *hot Iron*, and prevent the danger of bleeding, to which they are obnoxious even to destruction, though unseen and unheeded: Neither may you *disbranch* them, but with great caution, as about *March*, or before, or else in *September*, and then 'tis best, to prune up the side-branches close to the *Trunk*, cutting off all that are above a year old; if you suffer them too long, they grow too big, and the *cicatrice* will be more apt to spend the *Tree* in *gumme*; upon which accident I advise you to rub over their *wounds* with a mixture of *Cow-dung*; the neglect of this cost me dear, so apt are they to spend their *Gum*. Some advise us to break the shells of *Pines* to facilitate their *delivery*, and I have essay'd it, but to my losse; *Nature* does *obstetricate*, and do that office of her self, when it is the proper season; neither does this preparation at all prevent those which are so buried, whiles their hard *Integuments*, protect them both from *rotting*, and the *Vermine*.

7. The *domestic Pine* grows very well with us both in *Mountains* and *Plains*; but the *Pinaster* or wilder (of which are four sorts) best for *Walks*, because it grows tall, and proud, maintaining their Branches at the sides, which the *Pine* does lesse frequently.

8. The *Fir* grows tallest, being planted reasonable close together; but suffers nothing to thrive under them. The *Pine* not so *Inhospitable*; for (by *Plinies* good leave) it may be sown with any *Tree*, all things growing well under its *shade*, and excellent in *Woods*; hence *Claudian*,

The friendly *Pine* the mighty *Oke* invites.

Et comitem quercum Pinus amica trahit.

9. They both affect the *cold*, *high*, and *rockie* grounds, *Abies in montibus altis*; yet will grow in better, but not in over rich, and *pinguid*. The worst Land in *Wales* bears (as I am told) large *Pine*; and the *Fir* according to his aspiring nature, loves also the *Mountain* more than the *Valley*; but *ἐν τοῖς παλαιοῖς ὄρεσιν οὐ μέλει*, It cannot endure the *Shade*, as *Theophrastus* observes, *de Pl. l. 4. c. 1*. But this is not rigidly true; for they will grow in *Consort*, till they even shade, and darken one another, and will also descend from the *Hills*, and succeed very well, being desirous of plentiful *waterings*, till they arrive to some competent *stature*; and therefore they do not prosper so well in an over *sandy*, and *hungry* Soil, or *gravel*, as in the very entrails of the *Rocks*, which afford more *drink* to the *Roots*, that penetrate into their *meanders*, and winding recesses. But though they require this *refreshing* at first, yet do they perfectly abhor all *stercoration*; nor will they much endure to have the earth open'd about their *Roots* for *Ablaqueation*, or be disturb'd. This is also to be understood of *Cypress*. A *Fir* for the first half dozen years seems to stand, or at least make no considerable advance; but it is when thoroughly *rooted*, that it comes away miraculously. That Honourable Knight Sir Norton Knatchbull (whose delicious *Plantation* of *Pines*, and *Firs* I beheld with great

great satisfaction) having assur'd me that a *Fir-tree* of his raising, did shoot no less than sixty foot in *height*, in little more than *twenty* years, is a pregnant instance, as of the speedy growing of that *material*; so of all the encouragement I have already given for the more frequent cultivating this ornamental, useful, and profitable Tree.

10. The *Picea* is another sort of *Pine*, and to be cultivated like it, the cold grounds which these *Plants* most affect, though it be hard to discover,

Pitch.

Yet sometimes *Pitch-trees* and the noxious *Yew*,
Or the dark *Ivy* will dire Symptoms shew.

— *Picea tantum, taxique nocentes*
Interdum, aut edere possunt Vestigia nigra.
Georg. 2.

And therefore I am not satisfied why it might not prosper in some tollerable degree in *England*, as well as in *Germany*, *Russia*, the Colder *Tracts*, and abundantly in *France*: It grows on the *Alpes* among the *Pine*, but neither so tall nor so upright, and produces a *Gum* almost as white and firm as *Frankincense*: But it is the *Larix* (another sort of *Pine*) that yields the *Venetian Turpentine*.

11. There is also the *Piceaster* (a wilder sort) out of which the greatest store of *Pitch* is boyl'd. The *Teda* likewise, which is a sort abounding in *Dalmatia*, more unctious, and more patient of the warmer situations, and so inflamable, that it will slit into *Candles*, and therefore some will by no means admit it to be of a different *Species*, but a *metamorphosis* of over-grown fattenesse, to which the most Judicious incline.

12. The *Bodies* of these being cut, or burnt down to the ground, will emit frequent *Suckers* from the *Roots*; but so will neither the *Pine* nor *Fir*: But the *Fir* may be propagated of *Layers*, which I divulge, as a considerable *Secret* that has been essay'd with success.

13. That all these, especially the *Fir*, and *Pine*, will prosper well with us is more than probable, because it is a kind of *Demonstration* that they did heretofore grow plentifully in *Cumberland*, *Cheshire*, *Stafford*, and *Lancashire*, if the multitudes of these *Trees* to this day found intire, and buried under the *Earth*, though suppos'd to have been or'ethrown and cover'd so ever since the universal *Deluge*, be indeed of this *Species*: That incomparable *Naturalist*, the Learned *Dr. Merrett*, in his *Pinax*, speaks of several places of this *Nation*, where *subterraneous Trees* are found; as namely, in *Cornwal*, *ad finem terra*, in *agris Flints*; in *Penbrok-shire* towards the shore, where they so abound, *ut totum litus* (says the Doctor) *tanquam Sylva cædua apparet*; in *Cheshire* also, as we said, *Cumberland*, and *Anglesey*, and several of our *Euro-boreal tracts*, and are called *Noahs Ark*. By *Chatness* in *Lancashire* (says *Cambden*) the low *Mossie* ground was no very long time since, carried away by an impetuous *flood*, and in that place now lies a low irri-guous *Vale*, where many prostrate *Trees* have been digged out: These *Trees* were (some think) carried away in times past by some accident

accident of *Inundation*, or by *Waters* undermining the ground, till their own *weight*, and the *Winds* bow'd them down and overwhelm'd in the *Mud*: For 'tis observ'd, that these *Trees* are nowhere found but in *Boggie* places; but that the burning of these *Trees* so very bright, should be an *Argument* they were *Fir*, is not necessary, since the *Bituminous* quality of such *Earth* may have imparted it to them; and *Cambden* denies them to be *fir*-trees, suggesting the *Querie*; Whether there may not possibly grow *Trees* even under the *Ground*, as well as other things? There are in *Cumberland*, on the *Sea-shore*, *Trees* sometimes discover'd at *Low-water*, and at other times that lye buried in the *Sand*; and in other *Mossie* places of that *Shire* 'tis reported, the People frequently dig up the Bodies of vast *Trees* without *Boughs*, and that by direction of the *Deaw* alone in *Summer*; for they observe it never lyes upon that part, under which those *Trees* are interr'd. These particulars I find noted by the Ingenious *Authour* of the *Britannia Baconica*: But we shall enquire farther concerning these *Subterranean* Productions anon, and whether the *Earth*, as well as the *Water*, have not the vertue of strange *Transmutations*: These *Trees* are found in *Moors* by poking with *Staves* of three or four foot length, rhod with *Iron*.

14. In *Scotland* (as we noted) there is a most beautiful sort of *Fir* growing upon the *Mountains*; of which from the late *Marquis* of *Argyle*, I had sent me some seeds, which I have sown with tolerable successe; and I prefer them before any other, because they grow both very erect, and fixing themselves stoutly, need little or no support. And there neer *Loughbrun*, 'twixt the *Lough* and an *Hill*, they grow in such quantity; that from the spontaneous Fall, Ruine, and Decay of the *Trees* lying cross'e one another to a Man's height, partly cover'd with *Mosse*, and partly *Earth* and *Grasse*, which rots, fills up, and grows again, a considerable *Hill* has in proceffe of time been raised to almost their very tops, which being an Accident of singular remark, I thought fit to mention.

15. For the many, and almost universal use of these *Trees*, both *Sea* and *Land* will plead,

The useful *Pine* for Ships ———

——— *dam utile Lignum*
Navigis Pini ———

Georg. 2.

Hence *Papinius* 6. *Thebaid.* calls it *andax abies*. They make our best *Mast*, *Sheathing*, *Scaffold-poles*, &c. heretofore the whole *Vessel*. It is pretty (saith *Pliny*) to consider, that those *Trees* which are so much sought after for Shipping, should most delight in the highest of *Mountains*, as if it fled from the *Sea* on purpose, and were afraid to descend into the *Waters*. With *Fir* we likewise make all intestine works, as *Wainscot*, *Floors*, *Pales*, *Balks*, *Laths*, *Boxes*, *Bellies* for all Musical Instruments in general, nay the *Ribs* and *Sides* of that enormous *Stratagem*, the so famous *Trojan Horse*, may be thought to be built of this *Material*, and if the *Poet* mistake not.

—— The

— The Ribs with *Deal* they fit:— *Sed lignum interuenit Abiete costis.*

Æn. 2.

It is exceeding smooth to *polish* on, and therefore does well under *Gilding* work, and takes *black* equal with the *Pear-tree*: Both *Fir*, and especially *Pine*, succeed well in *Carving*, as for *Capitols*, *Festoons*, nay *Statues*, especially being *Gilded*, because of the easiness of the *Grain*, to work and take the *Tool* every way; and he that shall examine it nearly, will find that famous *Image* of the *B. Virgin* at *Loretto* (reported to be Carved by the hands of *S. Luke*) to be made of *Fir*, as the grain easily discovers it. The *Tornulus* (as *Vitruvius* calls it) and *heart* of *Deal*, kept dry, rejecting the *Albumen* and white is everlasting; nor does there any *Wood* so well agree with the *glew*, as it, or so easie to be wrought: It is also excellent for *Beams*, and other *Timber-work* in *Houses*, being both light, and exceedingly strong, and therefore of very good use for *Barrs* and *bolts* of *Doors*, as well as for *Doors* themselves, by reason of a natural *Spring* which it has, not easily violated: You shall find, that of old they made *Carts*, and *Coaches* of it: For *Scaffolding* also there is none comparable to it; and I am sure we find it an extraordinary savor of *Oak* where it may be had at reasonable price. I will not complain what an incredible mass of ready *Money* is yearly exported into the *Northern Countreys* for this sole Commodity, which might all be saved were we *industrious* at home. Likewise from *Fir* we have the most of our *Pot-Ashes*: Of *Fir* are made our *Torch* or *Funebral-staves*; nay, and of old, *Spears* of it, if we may credit *Virgil's Amazonian* Combate,

— She prest

A long *Fir* Spear through his exposed Breast.— *Cuius apertum**Adversus longâ transverberat abiete pectus.*

Æn. 11.

Lastly, the very *Chips*, or *Shavings* of *Deal-boards*, are of other use than to kindle *Fires* alone: *Thomas Bartholinus* in his *Medicina Danorum Dissert.* 7. &c. where he disclaims the use of *Hops* in *Beer*, as pernicious and malignant, and from several instances how apt it is to produce and usher in *Infections*, nay, *Plagues*, &c. would substitute in its place, the *Shavings* of *Deal-boards*, as he affirms, to give a grateful *odor* to the *Drink*; and how soverain those *resinous woods*, the *Tops* of *Fir* and *Pines*, are against the *Scorbut*, we generally find: It is in the same *Chapter* that he commends also *Wormwood*, *Marrubium*, *Chameleagnum*, *Sage*, *Tamarisc*, and almost any thing rather than *Hopps*. The *Pine*, or *Picea* buried in the *Earth* never decay: From the latter *transudes* a very bright and pellucid *Gum*; hence we have likewise *Rosin*; also of the *Pine* are made *Boxes*, and *Barrels* for *dry Goods*; yea, and it is cloven into *Shingles* for the covering of *Houses* in some places; also *Hoops* for *Wine-Vessels*, especially, of the easily flexible *Wild-Pine*; not to forget the *Kernels* (this *Tree* being alwayes furnish'd with *Cones*, some ripe, others green) of such admirable use in *Emulsion*, and

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the

the *Tooth-pickers* for which even the very *leaves* are commended : In sum, they are *Plantations* which exceedingly improve the *Air* by their *oderiferous*, and *balsamical* emissions, and for ornament, create a *perpetual Spring* where they are plentifully propagated. And if it could be proved that the *Almugim-trees*, Recorded 1 *Reg.* 10. 12. and whereof *Pillars* for that famous *Temple*, and the *Royal Palace*, *Harps*, and *Psalteries*, &c. were made, were of this sort of *Wood* (as some doubt not to assert) we should esteem it at another rate; yet we know *Josephus* affirms they were a kind of *Pine-tree*, though somewhat resembling the *Fig-tree* wood to appearance, as of a most lustrous *Candor*. In the 2 *Chron.* 2. 8. there is mention of *Almug-trees* to grow in *Lebanon*; and if so, methinks it should rather be a kind of *Cedar*; (yet we find *Fir* also in the same period) for we have seen a whiter sort of it, even very *white* as well as *red*; though some affirm it to be but the *Sap* of it (so our *Cabinet-makers* call it) I say, they were both *Fir* and *Pine-trees* also growing upon those *Mountains*. Mr. *Purchas* informs us, that Dr. *Dee* Writ a laborious *Treatise* almost wholly of this Subject (but I could never have the good hap to see it) wherein, as *Commissioner* for *Solomon's Timber*, and like a Learned *Architect*, and *Planter*, he has summon'd a *Jury* of twelve sorts of *Trees*. namely, 1. the *Fir*, 2. *Box*, 3. *Cedar*, 4. *Cypresse*, 5. *Ebony*, 6. *Ash*, 7. *Juniper*, 8. *Larch*, 9. *Olive*, 10. *Pine*, 11. *Oke*, and 12. *Sandal-trees*, to examine which of them were this *Almugim*, and at last seems to concur with *Josephus*, in favour of *Pine* or *Fir*; who possibly from some antient *Record*, or *fragment* of the *Wood* it self, might learn something of it; and 'tis believ'd, that it was some material both *odoriferous* to the *Sent*, and *beautiful* to the *Eye*, and of fittest temper to refract *Sounds*; besides its serviceableness for *Building*, all which Properties are in the best sort of *Pine* or *Thyina*, as *Pliny* calls it; or perhaps some other rare *Wood*, of which the *Eastern Indias* are doubtlesse the best provided; and yet I find, that these vast *beams* which sustain'd the *Roof* of *S. Peter's Church* at *Rome*, laid (as reported) by *Constantine the Great*, were made of the *Pitch tree*, and have lasted from *Anno 336.* down to our dayes, above 1300. years.

16. But now whiles I am reciting the *Uses* of these beneficial *Trees*, Mr. *Winthorp* presents the *Royal Society* with the *Process* of making the *Tar* and *Pitch* in *New-England*, which we thus abbreviate. *Tar* is made out of that sort of *Pine-tree* from which naturally *Turpentine* extilleth; and which at its first flowing out is liquid and clear; but being hardned by the *Air*, either on the *Tree*, or where-ever it falls, is not much unlike the *Burgundy Pitch*; and we call them *Pitch pines* out of which this *gummy* substance transudes: They grow upon the most *barren Plains*, on *Rocks* also and *Hills* rising amongst those *Plains*, where several are found blown down, that have lain so many *Ages*, as that the vvhole *Bodies*, *Branches* and *Roots* of the *Trees* being perished, some certain *knots* onely of the *Boughs* have been left remaining intire (these *knots* are that part vvhich the *bough* is joyn'd to the
body

body of the Tree). lying at the same distance and posture as they grevv upon the Tree for its vvhole length. The Bodies of some of these Trees are not corrupted through age, but quite consum'd and reduc'd to ashes, by the annual burnings of the Indians, when they set their grounds on fire; which yet has, it seems, no power over these hard knots, beyond a black scorching; although being laid on heaps, they are apt enough to burn. It is of these knots they make their Tar in New-England and the Countrey adjacent, whiles they are well impregnated with that Terebinthine, and Resinous matter, which like a Balsam preserves them so long from putrifaction. The rest of the Tree does indeed contain the like Terebinthine Sap, as appears (upon any slight incision of bark on the stem, or boughs) by a small crystalline pearl which will sweat out; but this, for being more watery, and undigested by reason of the porosity of the Wood, which exposes it to the impressions of the Air and Wet, renders the Tree more obnoxious; especially, if it lye prostrate with the bark on, which is a receptacle for a certain Intercutaneous Worm, that accelerates its decay. They are the knots then alone which the Tar-makers amass in heaps, carrying them in Carts to some convenient place not far off, where finding Clay, or Loam fit for their turn, they lay an Hearth of such ordinary stone as they have at hand: This they build to such an height from the level of the ground, that a Vessel may stand a little lower then the Hearth, to receive the Tar as it runs out: But first, the Hearth is made wide according to the quantity of knots to be set at once, and that with a very smooth floor of Clay, yet somewhat descending, or dripping from the extreame parts to the middle, and thence towards one of the sides, where a gullet is left for the Tar to run out at. The Hearth thus finish'd, they pile the knots one upon another, after the very same manner as our Colliers do their wood for Char-coal; and of a height proportionable to the breadth of the Hearth; and then cover them over with a coat of loam or clay (which is best) or in defect of those, with the best, and most tenacious Earth the place will afford; leaving onely a small spiracle at the top, whereat to put the fire in; and making some little holes round about at several heights, for the admission of so much air as is requisite to keep it burning, and to regulate the fire by opening, and stopping them at pleasure. The proceffe is almost the same with that of making Char coal, as will appear in due place; for when it is well on fire, that middle hole is also stopp'd, and the rest of the Registers so govern'd, as the knots may keep burning and not be suffocated with too much smoak, whiles all being now through-heated, the Tar runs down to the Hearth, together with some of the more watry Sap, which hasting from all parts towards the middle, is convey'd by the fore-mention'd gutter into the Barrel, or Vessel placed to receive it: Thus, the whole Art of Tar-making is no other, than a kind of rude distillation per descensum, and might therefore be as well done in Furnaces of large capacity, were it worth the expence. When the Tar is now all melted out, and

run, they stop up all the *vents* very close; and afterwards find the *knots* made into excellent *Char-coal*, preferr'd by the *Smiths* before any other whatsoever which is made of wood; and nothing so apt to burn out when their *blast* ceaseth; neither do they *sparkle* in the *fire*, as many other sorts of *Coal* do; so as, in defect of *Sea-coal*, they make choice of *this* as best for their use, and give greater prices for it. Of these *knots* likewise do the *Planters* split out small *slivers* about the thickness of one's *finger*, or somewhat thinner, which serve them to burn in stead of *Candles*; giving a very good light. This they call *Candle-wood*, and it is in much use both in *New-England*, *Virginia*, and amongst the *Dutch planters* in their *Villages*; but for that it is something offensive, by reason of the much fuliginous *smoak* which comes from it, they commonly burn it in the *chimney-corner* upon a flat *stone* or *Iron*; except, occasionally, they carry a single *stick* in their hand, as there is need of light to go about the house. It must not be conceiv'd, by what we have mention'd in the former description of the *knots*, that they are only to be separated from the *bodies* of the *trees* by devouring *time*, or that they are the only *materials* out of which *Tar* can be extracted: For there are in these *Tracts* millions of *Trees* which abound with the same sort of *knots*, and full of *Turpentine* fit to make *Tar*: But the labour of *felling* these *Trees*, and of *cutting* out their *knots*, would far exceed the value of the *Tar*; especially in *Countries* where *Workmen* are so very dear: But those *knots* above mention'd, are provided to hand, without any other labour then the gathering only. There are sometimes found of those sort of *Pine-trees* the lowest part of whose stems towards the *root* is as full of *Turpentine* as the *knots*; and of these also may *Tar* be made: but such *Trees* being rarely found, are commonly preserved to split into *Candle-wood*; because they will be easily *riven* out into any lengths, and scantlings desir'd, much better then the *knots*. There be who pretend an *art* of as fully *impregnating* the body of any living *Pine-tree* for six or eight foot high; and some have reported that such an *art* is practis'd in *Norway*: But upon several *experiments*, by *girdling* the *Tree* (as they call it) and cutting some of the *bark* round, and a little *into* the *wood* of the *Tree*, six or eight foot distant from the ground, it has yet never succeeded; whether the just *season* of the year were not observ'd, or what else omitted, were worth the *disquisition*; if at least there be any such *secret* amongst the *Norwegians*, *Swedes*, or any other *Nation*. Of *Tar*, by boiling it to a sufficient *height*, is *Pitch* made: and in some places where *Rosin* is plentiful, a fit proportion of that may be dissolved in the *Tar* whiles it is boiling, and this *mixture* is soonest converted to *Pitch*; but it is of somewhat a differing *kind* from that which is made of *Tar* only, without other composition. There is a way which some *Ship-Carpenters* in those *Countries* have us'd, to bring their *Tar* into *Pitch* for any sudden use; by making the *Tar* so very hot in an *Iron-kettle*, that it will easily take *fire*, which when *blazing*, and set in an *airy* place, they let burn so long, till, by taking out

out some small quantity for trial, being *cold*, it appears of a sufficient *consistence* : Then by covering the *Kettle* close, the *fire* is extinguish'd, and the *Pitch* is made without more ceremony. There is a *process* of making *Rosin* also out of the same *knots*, by splitting them out into thin pieces, and then boiling them in *water*, which will educe all the *Resinous* matter, and gather it into a *body* which (when cold) will harden into pure *Rosin*. It is moreover to be understood, that the *Fir* and most *Coniferous* Trees, yield the same *Concretes*, *Lachrymæ*, *Turpentine*s, *Rosins*, *Hard*, *Naval* or stone and liquid *Pitch* and *Tar* for innumerable *uses*; and from the burning, and fuliginous vapour of these, especially, the *Rosin*, we have our *Lamp* and *Printers* black, &c. I am perswaded the *Pine*, and *Fir* trees in *Scotland*, might yield his *Majesty* plenty of excellent *Tar*, were some industrious Person employ'd about the work.

CHAP. XXIII.

Of the Larch, Platanus, Lotus, Cornus, &c.

1. **L***arix*, though of the *Coniferous* family, looses its *leaf*, and *Larch.* therefore we separate him from the *Firs* and *Pines*; but why we might not hope as well of the *Larch* as from any of them I know not: I read of *Beams* of no less than 120. foot in length made out of this goodly Tree, which is of so strange a composition, that 'twill hardly burn, as *Cæsar* found in a *Castle* he besieg'd built of it; (the story is recited at large by *Vitruvius* l. 2. c. 9.) but see what *Philander* says upon the place, on his own experience: yet the *Coals* thereof were held far better than any other for the melting of *Iron*. There is abundance of this *Larch* timber in the *Buildings* at *Venice*, especially about the *Palaces* in *Piazza San Marco*, where I remember *Scmozzi* says he himself us'd much of it, and infinitely commends it: *Tiberius* we find built that famous *Bridg* to his *Nau-machia* with it; and it seems to excel for *Beams*, *Dores*, *Windoers*, and will support an incredible *Weight*; which (and for its property of long resisting *fire*) makes *Vitruvius* wish they had greater plenty of it at *Rome* to make *Goists* of. From this Tree it is that useful Drug *Agaric* is gathered; and the timber of it is so exceedingly transparent, that *Cabanes* made of the thin *boards*, when in the dark night, they have lighted candles, people, who are at a distance without *dores*, would imagine the whole room to be on fire, which is pretty odd, considering there is no material so unapt to kindle. That which now grows some where about *Chelmsford* in *Essex*, arriv'd to a flourishing, and ample Tree, does sufficiently reproach our negligence and want of *industry*, as well as the incomparable and shady.

2. *Platanus*,

Platanus:

2. *Platanus*, that so beautiful and precious Tree, so doated on by *Xerxes*, that *Ælian* and other *Authors* tell us he made *halt*, and stop'd his prodigious Army of *seventeen hundred thousand* soldiers which even cover'd the *Sea*, exhausted *Rivers*, and thrust Mount *Athos* from the *Continent*, to admire the pulchritude and procerity of one of these goodly Trees, and became so fond of it, that spoiling both *himself*, his *Concubines*, and great Persons of all their *jewels*, he cover'd it with *Gold*, *Gems*, *Neck-laces*, *Scarfs* and *Bracelets*, and infinite riches; In sum, was so *enamor'd* of it, that for some days neither the concernment of his grand *Expedition*, nor interest of *honor*, nor the necessary motion of his portentous Army, could periwade him from it: He styl'd it his *Mistress*, his *Minion*, his *Goddesse*; and when he was forc'd to part from it, he caus'd the figure of it to be stamp'd in a *Medail* of *Gold*, which he continually wore about him. These Trees the *Romans* first brought out of the *Levant*, and cultivated with so much industry and cost, for its stately and proud head only; that great *Orators* and *States-men*, *Cicero* and *Hortensius* would exchange now and then a *turn* at the *Bar*, that they might have the pleasure to step to their *Villas*, and refresh their *Platans*, which they would often irrigate with *Wine* instead of *Water*; and so priz'd the very shadow of it, that when afterwards they transplanted them into *France*, they exacted a *Tribute* of any of the *Natives* who should presume but to put his head under it. *Pliny* tells us there is no Tree whatsoever which so well defends us from the heat of the *Sun* in *Summer*; nor that admits it more kindly in *Winter*. And for our encouragement, I do upon experience assure you, that they will flourish and abide with us, without any more trouble than frequent, and plentiful *Watering*, which from their youth they excessively delight in, and gratefully acknowledge by their growth accordingly; so as I am perswaded, that with very ordinary Industry, they might be propagated to the incredible Ornament of the *Walks* and *Avenues* to *Great-mens* houses. The Introduction of this true *Plane* amongst us, is due to that honorable Gentleman *Sir Geo. Crook* of *Oxfordshire*, from whose bounty I received an hopeful plant now growing in my *Villa*.

Macrob. Saturnal. 3.

3. There was lately at *Basil* in *Switzerland* an ancient goodly *Platanetum*, and now in *France* they are come again in vogue: I know it was antiently accounted *divine*; but they may with us be rais'd of their seeds with care, in a moist soil, as here I have known them: But the reason of our little success, is, that we very rarely have them sent us ripe; which should be gather'd late in *Autumn*, and brought us from some more *Levantine* parts than *Italy*. They come also of *Layers* abundantly; affecting a fresh and feeding ground; for so they plant them about their *Rivulets*, and *Fountains*. The *West-Indian Plane* is not altogether so rare, but it rises to a goodly Tree, and bears a very ample, and less jagged leaf: That the *Turks* use their *Platanus* for the building of *Ships*, I learn out of *Ricciolus Hydrol. l. 10. c. 37.*

Lotus.

4. The same opinion have I of the noble *Lotus*, (another lover of

of the *Water*) which in *Italy* yields both an admirable *shade*, and *Timber* immortal. Of this *Wood* are made *Pipes* and *Wind-Instruments*, and of its *Root*, *Hafts* for *knives*, and other *Tools*, &c. The offer of *Crassus* to *Domitius* for half a dozen of these *Trees* growing about an house of his in *Rome*, testifies in what esteem they were had for their incomparable beauty and use. The *Cornel-tree*, ^{*Cornus*} though not mention'd by *Plinie* for its *Timber*, is exceedingly commended for its durableness, and use in *Wheel-work*, *Pinns*, and *Wedges*, in which it lasts like the hardest *Iron*; and it will grow with us to good bulk and stature; and the preserv'd, and pickl'd *berries*, are most refreshing, and an excellent condiment.

CHAP. XXIV.

Of the Cypress-tree and Cedar.

C*Upressus*, the *Cypresse-Tree*, is either the *Sative* or *Garden tree*, ^{*Cypressi*} the most *pyramidal* and beautiful; or that which is call'd the *Male*, (though somewhat preposterously) which bears the *Cones*, but is of a more extravagant shape: should we reason only from our common *experience*, even the *Cypresse-tree* was, but within a few years past, reputed so tender, and nice a *Plant*, that it was cultivated with the greatest care, and to be found only amongst the *Curions*; whereas we see it now, in every *Garden*, rising to as goodly a bulk and stature, as most which you shall find even in *Italy* it self; for such I remember to have once seen in his late *Majesties Gardens* at *Theobalds*, before that *Princely* seat was demolish'd. I say, if we did argue from this *Topic*: Methinks it should rather encourage our *Country-men* to add yet to their *Plantations* other *Forreign* and *useful* *Trees*, and not in the least deter them, because many of them are not as yet become *endenizon'd* amongst us.

2. We may read that the *Peach* was at first accounted so tender and delicate a *Tree*, as that it was believ'd to thrive only in *Persia*; and even in the days of *Galen*, it grew no nearer then *Egypt*, of all the *Roman* *Provinces*, but was not seen in the *City* till more then *thirty* years before *Pliny's* time; whereas there is now hardly a more common and universal in *Europe*: Thus likewise, the *Avellana* from *Pontus* in *Asia*; Thence into *Greece*, and so *Italy*, to the *City* of *Abellino* in *Campania*.

Una tantum litera immutata, Avellina dici, quæ prius Abellina.

I might affirm the same of our *Damasco Plum*, *Quince*, *Medlar*, *Figue*, and most ordinary *Pears*, as well as of several other *Peregrine* *Trees*, *Fruit-bearers*, and *others*; For even the very *Damask-rose* it self, (as my Lord *Bacon* tells us *Cent. 2. Exp. 659.*) is little more than

than an hundred years old in *England*: Methinks this should be of wonderful incitement. It was 680 years after the foundation of *Rome*, ere *Italy* had tasted a *Cherry* of their own, which being then brought thither out of *Pontus* (as the above-mention'd *Filberts* were) did afterwards travel *ad ultimos Britannos*.

In ISIMYNYIO.

3. *Josephus* tells us, That the Cedar in *Judea* was first planted there by *Solomon*, who doubtless try'd many rare Experiments of this nature; and none more Kingly then that of Planting to Posterity. I do not speak of those which grow on the Mountains of *Libanus*, in the colder and Northern tracts of *Syria*: But as I am inform'd by that curious Traveller, *Ranwolfius*. i. Since also confirm'd by that Virtuoso Monsieur *Monconys*, there remaining now not above twenty four of those stately Trees in all those goodly Forests, where that mighty Prince set fourscore thousand Hewers at work for the Materials of one onely Temple and a Palace, 'tis a pregnant Example what Time, and Neglect will bring to ruine, if due, and continual care be not taken to propagate Timber.

4. Nor is it any wonder if we find the whole Species of some Trees so totally lost in a Countrey, as if there had never been any such planted in it: Be this therefore applied to *Fir*, *Pine*, and many others with us; since it was so long ere *Rome* was acquainted with them, or indeed with any of the Pitch-bearers.

5. We had our first *Myrtles* out of *Greece*, and *Cypresses* from *Creete*, which was yet a meer stranger in *Italy*, as *Pliny* reports, and most difficult to be raised; which made *Cato* to write more concerning the culture of it then of any other Tree: Notwithstanding we have in this Countrey of ours, no less then three sorts, which are all of them easily propagated, and prosper very well if they are rightly ordered; and therefore I shall not omit to disclose one secret, as well to confute a popular Errour, as for the Instruction of our Gard'ners.

6. The Tradition is, That the *Cypress* (being a Symbol of Mortality, they should say of the contrary) is never to be cut for fear of killing it. This makes them to impale, and wind them about like so many *Egyptian Mummies*; by which means the inward parts of the Tree being heated, for want of Air and Refreshment, it never arrives to any perfection, but is exceedingly troublesome, and chargeable to maintain; whereas indeed, there is not a more sensible and governable Plant in nature; For the *Cypress* may be cut to the very Roots, and yet spring afresh: And this we find was the husbandry in the Isle of *Ænaria*, where they us'd to fell it for Copse: For the *Cypress* being rais'd from the Nursery of Seeds sown in September (or rather March,) and within two years after transplanted, should at two years standing more, have the master stem of the middle shaft cut off some hand-breadth below the summit, the sides, and smaller sprigs shorn into a conique or pyramidal form, and so kept clipp'd from April to September, as oft as there is occasion; and by this Regiment they will grow furnish'd to the foot, and become the most beautiful Trees in the world, without binding or stake; still remembering to abate the middle stem, and to bring up the col-
lateral

lateral branches in its stead to what altitude you please; but when I speak of *shortning* the middle *shoot*, I do not intend the *dwarfing* of it, and therefore it must be done discreetly, so as it may not over-hastily advance, till the *foot* thereof be perfectly furnished: But there is likewise another, no lesse commendable expedient, to dresse this *Tree* with all the former advantages; if sparing the shaft altogether, you diligently cut away all the *forked branches*, reserving onely such as radiate directly from the *body*, which being shorn, and clipt in due season, will render the *Tree* very beautiful; and though more subject to obey the shaking *winds*, yet the natural *spring* of it, does immediately redress it, without the least discomposure; and this is a *secret* worth the learning of *Gard'ners*, who subject themselves to the trouble of *stakes* and *binding*, which is very inconvenient. Thus likewise may you form them into *Hedges* and *Topiary* works, or by sowing the *Seeds* in a shallow *furrow*, and plucking up the *Supernumeraries* where they come too close and thick: For in this *work* it shall suffice to leave them within a foot of each other; and when they are risen about a yard in height (which may be to the half of your *Palisado*) cut off their *tops*, as you are taught, and keep the sides *clipp'd*, that they ascend but by degrees, and thicken at the bottom as they climb. Thus, they will present you in half a dozen or eight years, with incomparable *hedges*, preferable to all others whatsoever, because they are perpetually green, and able to resist the *Winds* better than any which I know, the *Holly* only excepted, which indeed has no *peer*.

7. When I say *Winds*, I mean their fiercest *gusts*, not their *cold*: For though it be said, *Brumâque illâsa Cupressus*, and that indeed no *frost* impeaches them (for they grow even on the *snowy* tops of *Ida*,) yet our cruel *Eastern* winds do sometimes mortally invade them which have been late *clipp'd*, seldom the untouch'd, or that were *dressed* in the *Spring* only: The effects of the late *March* and *April* *Winds* (in the years 1663. and 1665.) accompanied with cruel *Frosts* and cold *blasts*, for the space of more then two *months* night and day, did not amongst neer a thousand *Cypresses* (growing in my *Garden*) kill above *three* or *four*, which for being very late cut to the *quick* (that is, the latter end of *October*) were raw of their *wounds*, took cold, and *gangreen'd*; some few others which were a little smitten towards the *tops*, might have escaped all their blemishes, had my *Gard'ner* capp'd them but with a *wisp* of *hay* or *straw*, as in my absence, I commanded. As for the *frost* of those *Winters* (then which I believe there was never known a more cruel and deadly piercing since *England* had a name) it did not touch a *Cypress* of mine till it joyn'd forces with that destructive *Wind*: Therefore for *caution*, clip not your *Cypresses* late in *Autumn*, and cloath them (if young) against these *winds*; for the *frosts* they only *discolour* them, but seldom, or never hurt them, as by long *experience* I have found.

8. If you affect to see your *Cypress* in *standard*, and grow wild

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(which may in time come to be of a large substance, fit for the most immortal of *Timber*) plant of the reputed *Male* sort; it is a *Tree* which will prosper wonderfully; and where the ground is *hot*, and *gravelly*, though (as we say'd) he be nothing so beautiful; and it is of *this*, that the *Venetians* make their greatest profit.

9. There is likewise the *Tarentine Cypress*, so much celebrated by *Cato*; I do not mean our *Savine*, (which some erroneously take for it, though there be a *Berry-bearing Savine*, much resembling the *Cypress*, which comes to prove a gallant, upright *Tree*, fit for the *Standard*.) Both *that*, and the *Milesian*, are worthy our culture.

10. I have already shew'd how this *Tree* is to be rais'd from the *seed*; but there was another *Method* amongst the *Ancients*, who (as I told you) were wont to make great *Plantations* of them for their *Timber*: I have practis'd it my self, and therefore describe it.

11. If you receive your *seed* in the *Nuts* which uses to be gather'd *thrice* a year, (but seldom ripening with us) expose them to the *Sun* till they *gape*, or neer a gentle *fire*, or put them in *warmed water*, by which means the *seeds* will be easily shaken out; for if you have them open before, they do not yield you half their crop. About the beginning of *April* (or before, if the weather be *showery*) prepare an even *Bed*, which being made of fine *earth*, clap down with your *spade*, as *Gard'ners* do for *Purselain-seed*: of old they roll'd it with some *Stone* or *Cylinder*. Upon this strew your *seeds* pretty thick; then sift over them some more *mould* somewhat better than half an *inch* in height: keep them duly *watered* after *Sun-set*, unless the season do it for you; and after one *years* growth (for they will be an *inch* high in little more than a *Moneth*) you may *transplant* them where you please. In watering them, I give you this *caution* (which may also serve you for most tender and delicate *seeds*) that you deaw them rather with a *broom* or *spergatory*, then hazard the beating them out with the common *watering-pot*; and when they are well come up, be but sparing of *water*: Be sure likewise that you cleanse them when the *weeds* are very young and tender, least in stead of *purging*, you quite erradicate your *Cypress*: We have spoken of *Watering*, and indeed whilst young, if well follow'd, they will make a prodigious advance: when that long, and incomparable walke of *Cypress* at *Frascati* neer *Rome* was first planted, they drew a small stream (and indeed *Irrigare* is properly thus, *aquam inducere riguis* (i.e.) in small gutters and rills) by the foot of it, (as the *Water* there is in abundance tractable) and made it arrive to seven or eight foot height in one year; but with us, we may not be too prodigal; since, being once well taken, they thrive best in our sandy, light, and warmest grounds, whence *Cardan* says, *juxta aquas arefcit*, meaning in low and moorish places, stiff and cold earth, &c. where they never thrive.

12. What the *Uses* of this *Timber* are, for *Chests* and other *Utensils*, *Harps*, and divers other *Musical Instruments* (it being a very sonorus

sonorous wood, and therefore employ'd for *Organ-pipes*, as heretofore for *supporters of Vines, Poles, Rails, and Planks*, (resisting the *Worm, Moth*, and all putrefaction to eternity) the *Venetians* sufficiently understand; who did every *twenty year*, and oftner (the *Romans* every *thirteen*) make a considerable *Revenue* of it out of *Candy*: And certainly a very gainful commodity it was, when the *Fell* of a *Cupressetum* was heretofore reputed a good *Daughters Portion*, and the *Plantation* it self call'd *Dotem filia*. But there was in *Candy* a vast *Wood* of these *Trees* belonging to the *Republique*, by malice or accident set on *Fire*, which *Anno 1400.* burnt for seven years continually, before it could be quite extinguish'd; fed so long a space by the *unctuous* nature of the *Timber*, of which there were to be seen at *Venice* planks of above *four* foot in bredth; and formerly the *Valves* of *Saint Peters Church* at *Rome* were framed of this *Material*, which lasted from the great *Constantine* to *Pope Eugenius* the *Fourth*s time, almost six hundred years; and then were found as fresh and intire as if they had been new: But this *Pope* would needs change them for *Gates* of *Brasse*, which were cast by the famous *Antonio Philarete*; not in my opinion so venerable as those other of *Cypresse*. It was in *Coffins* of this material, that *Thycidides* tells us, the *Athenians* us'd to bury their *Heros*.

13. The *Timber* of this wood was of infinite esteem with the *Antients*: That lasting *Bridge* built over the *Euphrates* by *Semiramis* was made of this wood; and it is reported, *Plato* chose it to Write his *Laws* in before *Brasse* it self, for the *diuturnity* of the matter: It is certain, that it never *rists* or *cleaves*, but with great violence; and the *bitternesse* of its *juice* preserves it from all *Worms*, and putrefaction. To this day those of *Creet*, and *Malta* make use of it for their *Buildings*; because they have it in plenty, and there is nothing out-lasts it, or can be more beautifull, especially than the *Root* of the wilder fort, incomparable for its *crisped undulations*. Divers *Learned Persons* have conceiv'd the *Gopher* mention'd in *holy Writ*, *Gen. 6. 14.* and of which the *Ark* was built, to have been no other than this *Κυπάρισσος*, *Cupar* or *Cuper*, by the easie mutation of *Letters*; and beside, 'tis known that in *Creet* they employ'd it for the same use in the largest *contignations*, and did formerly build *Ships* of it: And *Epiphanius* *Heres. l. 1.* tells us, some *Reliques* of that *Ark* lasted even to his dayes, and was judg'd to have been of *Cypresse*. Some indeed suppose that *Gopher* was the Name of a Place a *Cupressis*, as *Elon* a *Quercubus*; and might possibly be that which *Strabo* calls *Cupressetum* neer *Adiabens* in *Assyria*: But for the reason of its long lasting, *Coffins*, as noted, for the dead were made of it, and thence it first became to be *Diti Sacra*; and the *Valves* or *Doors* of the *Ephesine Temple* were likewise of it, as we observ'd but now were those of *St. Peters* at *Rome*: Works of *Cypresse wood*, permanent ad diuturnitatem, sayes *Vitruvius l. 2.* and the Poet

—perpetuâ nunquam moritura Cupressô.

Mart, E. 6. 6.

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But to resume the disquisition, whether it be truly so proper for *Shipping* is controverted, though we also find in *Cassiodorus* *Vor. l. 5. Ep. 16.* that *Theodoric* caused store of it to be provided for that purpose; and *Plato* (who we told you made *Laws* and *Titles* to be Engraven in it) nominates it *inter Arborea ναυπηγική, utilis. l. 4. leg.* and so does *Diodorus l. 19.* And as *Travellers* observe, there is no other sort of *Timber* fit for *Shipping*, so frequent as this *Tree* about those parts of *Assyria*, where the *Ark* is conjectur'd to have been built; so as those vast *Armadas* that *Alexander the Great* caus'd to be Equipp'd and set out from *Babylon*, consisted onely of *Cypresse*, as we learn out of *Arrian* in *Alex. l. 7.* and *Strabo l. 16.* *Paulus Colamennus* in his *αὐτὴν literaria cap. 24.* perstringes the most Learned *Jf. Vossius*, that in his *Vindicia pro LXX. Interp.* he affirms *Cypresse* not fit for *Ships*: But besides what we have produc'd, *Fuller*, *Bochartus*, &c. *Lilins Gyraldus* (*lib. de Navig. c. 4.*) and divers others, sufficiently evince it, and that the *Vessel* built by *Trajan* was of that material; lasting uncorrupt near 1400 years, when it was afterwards found in a certain *Lake*; if it were not rather (as I suspect) that which *Aeneas Silvius* reports to have been discovered in his time, lying under *Water* in the *Numician Lake*, crufted over with a certain feruginous mixture of *Earth* and *Scales*, as if it had been of *Iron*; but it was pronounc'd to be *Larix*, and not *Cypress*, employ'd by *Tiberius*. Finally (not to forget even the very chips of this precious wood, which gives that flavour to *Muscadines* and other rich *Wines*) I commend it for the improvement of the *Air*, and a specific for the *Lungs*, as sending forth most sweet, and aromatick emissions, when ever it is either clipp'd, or handled, and the chips, or cones being burnt, extinguishes *Moths*, and expells the *Gnats* and *Flies*, &c. not omitting the *Gum* which it yields, not much inferiour to the *Terbintine* or *Lentisc*. But,

Quid tibi odorato referam sudantia ligno,
if I forget

14. The *Cedar*? which grows in all extreams: In the moist *Barbados*, the hot *Bermudas*, the cold *New-England*; even where the *Snow* lyes as (I am assur'd) almost half the year: Why then it should not thrive in *Old England*, I conceive is from our want of industry: It grows in the *Bogs* of *America*, and in the *Mountains* of *Asia*; it seems there is no place affrights it: I have frequently rais'd it of the *Seeds*, which I set like the *Bay-berries*; and we might have of the very best kind in the *World* from the *Summer Islands*, though now almost utterly exhausted there also, and so the most incomparable of that sacred wood like to be quite destroy'd by our negligence, which is by nature almost eternal.

15. Thus I read that in the *Temple* of *Apollo* at *Utica*, there was found *Timber* of near two thousand years old; and in *Sagunti* of *Spain* a *Beam* in a certain *Oratory* consecrated to *Diana*, which had been brought from *Zant* two hundred years before the Destruction of *Troy*.

16. And here I cannot omit my *Wishes*, that since this precious material

material may be had at such tollerable rates, as certainly it might from *Cape Florida*, the *Bermudas*, and other parts of the *West Indias*: I say, I cannot but suggest, that our more Wealthy *Citizens* of *London*, now Building, might be encourag'd to use of it in their Shops; at least for *Shelves*, *Comptoirs*, *Chests*, *Tables*, *Wainscot*, &c. It might be done with moderate Expense, especially, in some small proportions, and in *Faneering*, as they term it, and mouldings, since beside the everlastingness of the wood not obnoxious to the *Worms*, and which would also be a means to preserve cloth, and other Ware from *Moths* and *corruption*; it would likewise be a Cure to reform the Malignity and corrosivenesse of the *Air*, and even preserve the whole *City* as if it stood amongst the *Spices* of the happy *Arabia*, or the prospects of *Mount Libanus*. Note, that the *Cedar* is of so dry a nature, that it will not well endure to be fastned with *Nails*, from which it usually shrinks, and therefore *pinns* of the same wood, are better.

17. The *Sittim* mention'd in holy *Writ*, is believ'd to have been a kind of *Cedar*, of which the most precious *Utensils* were formed; so that when they said a thing was *cedro digna*, the meaning was, *worthy of eternity*.

CHAP. XXV.

*Of the Cork, Ilex, Alaternus, Phyllyrea, Granad,
Lentisc, Myrtle, Jasmine, &c.*

1. **T**He *Cork* [*Suber*] of which there are *two* sorts (and divers *Corks* more in the *Indias*) one of a narrower lesse jagged leaf and *perenneal*; the other of a broader, falling in *Winter*; grows in the *coldest* parts of *Biscany*, in the *North* of *New-England*, in the *South-West* of *France*, especially the second *Species*, fittest for our *Climate*; and in all sorts of ground, dry *Heaths*, *Stony*, and *Rockie-Mountains*, so as the *Roots* will run even above the *Earth* where they have little to cover them; all which considered, methinks we should not despair: We have said where they grow plentifully in *France*; but by *Pliny*, *Nat. Hist.* l. 16. c. 8. it should seem they were since transplanted thither; for he affirms there were none either *there* or in *Italy*, in his time: But I exceedingly wonder that *Carolus Stephanus*, and *Crusius* should write so peremptorily, that there were none in *Italy*, where I my self have travell'd through vast *Woods* of them about *Pisa*, *Aquin*, and in divers tracts between *Rome* and the Kingdom of *Naples*. The *spanish Cork* is a species of the *Enzina*, differing chiefly in the *Leaf*,

Leaf, which is not so prickly; and in the *bark*, which is frequently, four or five inches thick: The manner of *decortication* whereof is *once* in two, or three years to strip it in a dry season; otherwise, the intercutaneous *moisture* indangers the *Tree*; when the *bark* is off, they unwarp it before the *fire*, and presse it *even*, and *that* with weights upon the *convex* part, and so it continues being cold.

2. The uses of *Cork* is well known amongst us both at *Sea* and *Land* for its resisting both *Water* and *Air*: The *Fisher-men* who deal in *Nets*, and all who deal with *Liquors* cannot be without it: Antient Persons prefer it before *Leather* for the *soles* of their *Shoes*, being light, dry, and resisting moisture, whence the *Germans* name it *Pantoffel-holz* (Slipper-wood) perhaps from the *Greek Παλις & ξύλον*, for I find it first applied to that purpose by the *Grecian Ladies*, whence they were call'd *light-footed*; I know not whether the *Epithite* do still belong to that *Sex*; but from them its likely the *Venetian Dames* took it up for their monstrous *Choppines*; affecting, or usurping an artificial eminency above *Men*, which *Nature* has denied them. Of one of the sorts of *Cork* are made pretty *Cups*, and other *Vessels*, esteem'd good to drink out of for *Hedical* persons: The *Egyptians* made their *Coffins* of it, which being lin'd with a *resinous* composition, preserv'd their *Dead* incorrupt: The poor People in *Spain* lay broad *Planks* of it by their *Beds-side*, to tread on (as great Persons use *Turkie* and *Persian Carpets*) to defend them from the *floor*, and sometimes they line, or *Wainscot* the *Walls*, and inside of their *Houses* built of *Stone*, with this *Bark*, which renders them very warm, and corrects the *moisture* of the *Air*: Also they employ it for *Bee-Hives*, and to double the insides of their *Contempliers*, and leather *Cases* wherein they put *Flasquera's* with *Snow* to refrigerate their *Wine*. This *Tree* has beneath the *Cortex* or *Cork*, two other *Coats*, or *Libri*, of which one is *reddish*, which they strip from the *bole* when 'tis fell'd onely; and this bears good price with the *Tanner*: The rest of the *wood* is very good firing, and applicable to many other uses of *Building*, *Palisade* work, &c.

Ilex.

3. *Ilex major glandifera* or great *Scarlet Oak*, thrives manifestly with us; witness His Majesties *Privy Garden* at *White-Hall*, where once flourish'd a goodly *Tree* of more than *four score* years growth, though there be now but a sickly *Impe* of it remaining.

4. By what I have touch'd in the *Chapter* of the *Elms*, concerning the *peregrination* of that *Tree* into *Spain* (where even in *Plinie's* time there were none, and where now they are in great abundance) why should we not more generally endeavour to propagate the *Ilex* amongst us; I mean, that *Baccifera*, which the *Spaniards* call the *Enzina*, and of which they have such *Woods*, and profitable *Plantations*? They are an hardy sort of *Tree*, and familiarly rais'd from the *Acorn*, if we could have them found and well put up in *Earth* or *Sand*, as I have found by experience.

5. The *wood* of these *Ilex's* is serviceable for many uses, as *flocks* of

of *Tools, Mallet-heads, Mall-balls, Chairs, Axeltrees, Wedges, Beet'es, Pins,* and above all for *Palisadoes* us'd in *Fortifications*. Besides, it affords so good *fuel*, that it supplies all *Spain* almost with the best and most lasting of *Charcoales*, in vast abundance. Of the *first* kind is made the *Paynten Lac* extracted from the *berries*; to speak nothing of that noble Confection *A. kermes*: The *Acorns* of the first yield excellent nourishment for *Rustics*, sweet, and little, if at all, inferiour to the *Cheffe nut*; and *this*, and not the *Fagus*, was doubtlesse the true *Esculus* of the *Antients*, the Food of the *Golden Age*. The wood of the *Enzina* when old, is curiously *chamblet- ted*, and embroidered with Natural *vermiculations* as if it were painted.

6. The *Alaternus*, which we have lately receiv'd from the hot- *Alaternus.* test parts of *Languedoc* (and that is equal with the heat of almost any *Countrey* in *Europe*) thrives with us in *England*, as if it were an *Indigene* and *Natural*.

7. I have had the honour to be the first who brought it into Use and reputation in this *Kingdom* for the most beautiful, and useful of *Hedges*, and *Verdure* in the vworld (the *swiftnesse* of the growth consider'd) and *propagated* it from *Cornwall* even to *Cumberland*: The seed grovvs ripe vvith us in *August*; and the hony-breathing *blossomes*, afford an early, and mervellous relief to the *Bees*.

8. All the *Phillyrea's* are yet more *hardy*; vvhich makes me *Phillyrea.* vvonder to find the *Angustifolia* planted in *Cases*, and so charily set into the *Stoves*, amongst the *Oranges* and *Lemmons*; vvhen by long *experience*, I have found it equal our *Holly* in suffering the extreamest rigours of our cruellest *Frosts*, and *Winds*, vvhich is doubtlesse (of all our *English Trees*) the most insensible and stout.

9. They are (both *Alaternus* and *this*) raised of the *Seeds* (though those of the *Phillyrea* vvill be long under ground) and being transplanted for *Espalier* hedges, or *Standards*, are to be govern'd by the *Shears*, as oft as there is occasion: The *Alaternus* vvill be up in one *Month* after it is sovvn: Plant it out at tvo years grovvth, and clip it after *rain* in the *Spring*, before it grovvs stickey, and vvhiles the shoots are tender; thus vvill it form an *bedge* (though planted but in single rows, and at two foot distance) of a yard in thicknesse, twenty foot high (if you desire it) and furnish'd to the bottom: But for an hedge of this altitude, it would require the friendship of some *Wall*, or a *Frame* of lusty *Poles*, to secure against the *Winds* one of the most delicious objects in nature: But if we could have store of the *Phillyrea folio leviter serrato* (of which I have rais'd some very fine *Plants* from the *Seeds*) we might fear no *weather*, and the *verdure* is incomparable.

10. The Culture of the *Granade* (of which are three sorts) *Granade.* does little differ from that of the *Alaternus*, of which we might raise considerable *Hedges* on all our *Southern Aspects*: They have supported that most unmerciful *Winter* in *sixty three*, without any artifice;

artifice; and if they yield us their *flowers* for our pains of well *pruning* and *Recision* (for they must diligently be purged of their *wood*) it is a glorious recompence: I plant them in my *Hedge-rows* even amongst the *Quick*; but to have them thrive, you must loosen the *Earth* at *Roots*, and enrich it both *Spring* and *Autumn*, leaving but a few woody-branches: There is no *Tree* so *Adulterous* as this *Shrub*, and best by *Layers Approach* and *Inarching*, as they call it; and thence 'tis said to marry with *Lawrells*, *Damson*, *Ash*, *Almond*, *Mulberry*, *Citron*, &c. too many (I fear) to hold: If you will plant them in *Gardens* to best advantage, keep them to one *Stem*, and enrich the *mould* with *Hogs dung* well consum'd, which they greatly delight in.

Myrtil.

11. The vulgar *Italian* wild *Myrtil* (though not indeed the most *fragrant*) grows high, and supports all *weathers*. I know of *one* near *fifty* years old, which has been continually *expos'd*; unlesse it be, that in some exceeding *sharp* Seasons, a little dry *straw* has been thrown upon it; and where they are *smitten*, being cut down near the ground, they put forth and recover again; which many times they do not in *Pots*, and *Cases*, where the *Roots* are very obnoxious to perish with *mouldiness*. The shelter of a few *Mats*, and *Straw*, secur'd very great *Trees* (both leaf and colour in perfection) this last *Winter* also, which were planted *abroad*; whiles those that were carried into the *Conserve*, were most of them lost. *Myrtils* may be rais'd of *Seeds*, but with great caution; and they seldom prove hardy, nor is it worth the time, being so abundantly encreased of *Layers*.

Lentisc.

12. *Lentiscus*, the *Lentisc*, a very beautiful *ever-green*, will thrive abroad with us, with a little care and shelter, amongst other *expos'd* Shrubs, and may be propagated of *Suckers* and *Layers*; and the like may be done by the *Olive*, though it bear no other *Fruit* than the perennial verdure of the *leaves*: Of the *Lentisc* are made the best *Tooth-pickers* in the world, and the *Mastic*, or *Gum* is of excellent *use*, especially for the *Teeth* and *Gums*.

13. I might to these add *Lignum vitæ*, the *Æthiopic Sefeli*, *Halmus Latifolius*, *Laurus Tinus*, *Celastrus*, &c. fittest for the *shrubby* part and under-furniture of our *ever green Groves*, and near our *Gardens* of *Pleasure*. But

14. I produce not these *particulars*, and other *amena vireta* already mention'd, as signifying any thing to *Timber*, the main design of this *Treatise* (though I read of some *Myrtils* so tall, as to make *Spear-shafts*) but to *exemplifie* in what may be farther added to *Ornament* and *Pleasure*, by a cheap, and most agreeable *industry*. The *Berries* of *Myrtil* were us'd of old in stead of *Peper*.

Jasmine.

15. The common *white* and *yellow* *Jasmine* would *flower* plentifully in our *Woods*, and as hardy as any of the *Periclimena*: How it is propagated by *submersion*, or *layers*, every *Gardner* skills; and if it were as much employ'd for *Nose gays*, &c. with us, as it is in *France* and *Italy*, they might make *money* enough of the *Flowers*: One sorry *Tree* in *Paris*, where they abound, has been worth to a poor *Woman* near *twenty* shillings in a year.

CHAP.

CHAP. XXVI.

Of the *Acacia*, *Arbutus*, *Bays*, *Box*, *Yew*, *Holly*,
Juniper, and *Laurel-trees*.

1. **T**He *French* have lately brought in the *Virginian Acacia*, *Acacia.* which exceedingly adorns their *Walks*: The Tree is hardly against all the invasions of our sharpest seasons, but our high *Winds*; which by reason of its brittle nature it does not so well resist; and the *Roots* (which insinuate and run like *liquorize* under ground) are apt to *emaciate* the *Soil*, and therefore haply not so commendable in our *Gardens*, as they would be agreeable for variety of *Walks* and shade: They thrive well in his *Majesties* new *Plantation* in *St. James's Park*.

2. But why do we thus neglect the *Arbutus*, and make that such a *rarity*, which grows so common, and so naturally in *Ireland*? It is indeed with some difficulty rais'd from the *Seeds*; but it may be propagated from the *Layers*, grows to a goodly Tree; is patient of our severest Weather, and may be contriv'd into most beautiful *Hedges*: *Virgil* reports it will *inoculate* with the *Nut*; and I find *Banhus* commends the *Coals* for *Gold-smiths* works, and the *Poet* *Arbutus.*

Arbutan Harrows and the mystic *Van*.

Arbutan crates, & mystic Vannus Jacchi.

Georg. 1.

3. *Bays* are increas'd both of their *Suckers*, and *Seeds*, which *Bays.* should be *dropping-ripe* ere gather'd: *Pliny* has a particular *process* for the ordering of the *Seeds*, and it is not to be rejected: Which is, the gathering the *Berries*, in *January*, and spreading them till their sweat be over; then he puts them in *dung* and sows them: As for the steeping in *Wine*, *Water* does altogether as well; others wash the *seeds* from their *mucilage*, by breaking and bruising the glutinous *berries*; then sow them in *March* by scores in a heap; and indeed so they will come up in *clusters*, but nothing so well, nor fit for *transplantation*, as where they are *interr'd* with a competent scattering, so as you would furrow *Pease*: Both this way, and by setting them apart (which I most commend) I have rais'd multitudes, and that in the *Berries* without any farther *preparation*; onely for the first two years they would be defended from the piercing *winds* which frequently destroy them; and yet the scorching of their tender *leaves* ought not make you despair, for many of them will recover beyond expectation.

S

4. This

4. This aromatic Tree greatly loves the *Shade*, yet thrives best in our hottest *gravel*, having once pass'd those first difficulties: *Age* and *Culture* about the *Roots* wonderfully augment its growth; so as I have seen *Trees* near thirty foot high of them; and almost two foot *diameter*. They are fit also both for *Arbour* and *Palisade-work*, so the *Gard'ner* understand when to prune, and keep it from growing too *woody*.

Box.

5. The *Box* which we begin to *proscribe* our *Gardens* (and indeed *Bees* are no friend to it) should not yet be banish'd from our care; because the excellency of the *wood* does commute for the unagreeableness of its smell: therefore let us furnish our cold, and barren *Hills*, and declivities with this useful *Shrub*, I mean the taller sort, for I meddle not here with the *dwarf* and more *tonfide*; It will increase abundantly of *slips* set in *March*.

6. The *Turner*, *Ingraver*, *Carver*, *Mathematical-Instrument*, *Comb* and *Pipe-makers* (*Si buxos inflare juvat* — *Virg.*) give great prizes for it by *weight*, as well as *measure*; and by the *seasoning*, and divers manner of *cutting*, vigorous *insolations*, *politure* and *grinding*, the *Roots* of this Tree (as of even our common and neglected *Thorne*) do furnish the *Inlayer* and *Cabinet-makers* with pieces rarely *undulated*, and full of variety. Also of *Box* are made *Wheels* or *Shivers* (as our *Ship-Carpenters* call them) and *Pinns* for *Blocks* and *Pullies*; *Pegs* for *Musical Instruments*, *Nut-crackers*, *Weavers Shuttles*, *Hollar-sticks*, *Bump-sticks*, and *Dressers* for the *Shooe-maker*, *Rulers*, *Rolling-pins*, *Pestles*, *Mall-balls*, *Beetles*, *Topps*, *Tables*, *Cheff-men*, *Screws* male and female, *Bobins* for *Bone-lace*, *Spoons*, nay the stoutest *Axle-trees*; but above all,

Box-Combs bear no small part
In the *Militia* of the *Female Art*;
They tie the *Links* which hold our *Gallants* fast,
And spread the *Nets* to which fond *Lovers* fast.

Non ultima belli
Arma Puellaris; Laqueos hac nectit Amantissim,
Et venaricis disponit retia Forma.

Couleii Pl. l. 6

7. The *Chymical* oyl of this *wood* has done the feats of the best *Guajacum* (though in greater quantity) for the Cure of *Venerical* Diseases, as one of the most expert *Physicians* in *Europe* has confess'd.

Eugh.

8. Since the use of *Bows* is laid aside amongst us, the propagation of the *Eugh-tree* (of which we have two sorts, and other places reckon more, as the *Arcadian* black, and red; the yellow of *Ida*, infinitely esteem'd of old) is likewise quite forborn; but the neglect of it is to be deplor'd; seeing that (besides the rarity of it in *Ita'y*, and *France*, where but little of it grows) the barrenest grounds, and coldest of our *Mountains* (for

Aquilonem & frigora taxi) might be profitably replenish'd with them: I say, profitably, for, besides the use of the *wood* for *Bows*

Ilyraostaxi torquentur in arcus. (for which the close, and more deeply dy'd is best.) The foremention'd *Artists* in

in *Box* most gladly imploy it : And for the *Cogs* of *Mills*, *Posts* to be set in moist grounds, and everlasting *Axle trees*, there is none to be compar'd with it ; likewise for the bodies of *Lutes*, *Theorbas*, *Bowles*, *Wheels*, and *Pinnis* for *Pullys* ; yea, and for *Tankards* to drink out of ; whatever *Pliny* report concerning its *Shade*, and the stories of the Air about *Thasus*, the Fate of *Catuvulcus* mention'd by *Cæsar*, and the ill report which the *Fruit* has vulgarly obtain'd in *France*, *Spain*, and *Arcadia* ; But,

How are poor Trees abus'd ?

Quam multa Arboribus tribuuntur crimina falsa !

9. The *Toxic* quality was certainly in the *Liquor* which those good *Fellows* tippl'd out of those *Bottles*, not in the nature of the *wood* ; which yet he affirms is cur'd of that *Venenous* quality, by driving a *brazen-wedge* into the Body of it : This I have never tri'd, but that of the *Shade* and *Fruit* I have frequently, without any deadly, or noxious effects : so that I am of opinion that *Tree* which *Sestius* calls *Smilax*, and our *Historian* thinks to be our *Engb*, was some other *wood* ; and yet I acknowledge that it is esteem'd noxious to *Cattel*, when 'tis in the *Seeds*, or newly sprouting.

10. This *Tree* is easily produc'd of the *Seeds*, wash'd and cleans'd from their *mucilage* ; and buried in the ground like *Haws* ; It will commonly be the second *Winter* ere they peep, and then they rise with their *caps* on their *heads* : Being three years old you may transplant them, and form them into *Standards*, *Knobs*, *Walks*, *Hedges*, &c. in all which works they succeed marvellous well, and are worth our patience for their *perennial verdure*, and *durableness*.

11. He that in *winter* should behold some of our highest *Hills* in *Surrey* clad with whole *Woods* of these two last sort of *Trees*, for divers Miles in *circuit* (as in those delicious *Groves* of them, belonging to the *Honourable*, my noble Friend Sir *Adam Brown* of *Bech-worth-Castle*, from *Box-hill*, and neer our famous *Mole* or *Swallow*) might without the least violence to his *Imagination*, easily phantasie himself transported into some new or enchanted *Country* ; for, if any spot of *England*,

— 'Tis here
Eternall Spring, and Summer all the year.

Hic ver perpetuum, atque alienis mensibus æstas.

12. But, above all the natural *Greens* which enrich our *home-born* store, there is none certainly to be compar'd to the *Agrifolium*, or *Acuifolium* rather, our *Holly*, inasmuch as I have often wonder'd at our *curiosity* after foreign Plants, and expensive *difficulties*, to the neglect of the culture of this vulgar, but *incomparable* tree ; whether we will propagate it for *Use*, and *Defence*, or for *sight* and *Ornament*.

A Hedge of *Holly*, Thieves that would invade,
Repulses like a growing Palizade ;
Whose numerous leaves such *Orient Greens* invest
As in deep *Winter* do the *Spring* arest.

— Mala furta hominum densis mucronibus æscens
Securum defendit in expugnabilis Hortum ;
Exornatque simul, toto spectabilis anno,
Et numero & viridifoliorum luce nitentum.

Coultii Pl. l. 6.

13. Is there under *Heaven* a more glorious and refreshing object of the kind, than an impregnable *Hedge* of *one hundred and sixty foot in length, seven foot high, and five in diameter*, which I can shew in my poor *Gardens* at any time of the year, glitt'ring with its arm'd and vernish'd leaves? the taller *Standards* at orderly distances blushing with their natural *Coral*: It mocks at the rudest assaults of the *Weather, Beasts, or Hedge-breakers,*

Et illum nemo impunè laceffit.

It is with us of *two* eminent kinds, the *prickly*, and *smoother leav'd*, or as some term it, the *Free-holly*, not unwelcome when tender, to *Sheep, and other Cattel.*

14. I have already shew'd how it is to be rais'd of the *Berries* (of which there is a sort bears them *yellow*) when they are ready to drop, this onely omitted, that they would first be freed from their tenacious and glutinous *Mucilage* by being wash'd, and a little bruised, then dry'd with a Cloth; or else bury them as you do *Hippis*; and let our *Forester* receive *this* for no common secret, and take notice of the effect: Remove them also after three or four years; but if you plant the *Sets* (which is likewise a commendable way, and the *Woods* will furnish enough) place 'em *Northwards*, as they do *Quick*. Of *this* might there living *Pales* and *Enclosures* be made (such as the Right Honourable my Lord *Dacres*, somewhere in *Sussex*, has a *Park* almost environ'd with, able to keep in any *Game*, as I am credibly inform'd) and cut into *square Hedges*, it becomes impenetrable, and will thrive in *hottest* as well as the *coldest* places. I take thousands of them four inches long out of the *Woods* (amongst the fall'n leaves whereof, they sow themselves) and so Plant them; but this should be before the *Cattel* begin to crop them, especially *Sheep*, who are greedy of them when tender: Stick them into the ground in a *moist* season, *Spring*, or *Autumn*; especially the *Spring*, shaded (if it prove too hot and scorching) till they begin to shoot of themselves, and in very sharp *Weather*, and during our *Eastern Etesians*, cover'd with *dry straw* or *Haume*; and if any of them seem to perish, cut it close, and you shall soon see it revive. The lustyer and bigger the *Sets* are, the better, and if you can procure such as are a *Thumb-breadth* thick, they will soon furnish into an *Hedge*. At *Denge-ness* in *Kent* they grow naturally amongst the very *beach* and *pibbles*: And this rare *Hedge*, the boast of my *Villa*, was planted upon a *burning Gravel*, expos'd to the *meridian Sun*.

15. True it is, that *time* must bring this *Tree* to perfection; it does so to all things else, & *posteritati pangimus*. But what if a little *culture* about the *Roots* (not *dunging*, which it abhors) and frequent stirring of the *mould* doubles its growth? We stay *seven years* for a tolerable *Quick*, it is worth staying it *thrice* for *this*, which has no *Competitor*.

16. And yet there is an expedient to effect it more insensibly, by planting

planting it with the *Quick* : Let every *fift* or *sixt* be an *Holly-set*, they will grow up infallibly with your *Quick*, and as they begin to spread, make way for them, by extirpating the *White-thorn*, till they quite domineer : Thus was my *Hedge* first Planted, without the least interruption to the *Fence*, by a most pleasant *Metamorphosis*. But there is also another, not less applauded, by laying along of well rooted *Sets* (a yard or more in length) and stripping off the *leaves* and *branches* : these cover'd with a competent depth of earth, will send forth innumerable *Suckers*, which will suddenly advance into an *Hedge*.

17. The *Timber* of the *Holly* (besides that it is the *Whitest* of all hard *woods*, and therefore us'd by the *In-layer*, especially, under thin plates of *Ivory* to render it more conspicuous) is for all sturdy *uses* ; the *Mill-Wright*, *Turner* and *Engraver* prefer it to any other : It makes the best *handles*, and *stocks* for *Tools*, *Flayles*, *Riding-rods* the best, and *Carters whips* ; *Bowles*, *Shivers*, and *pins* for *Blocks* ; Also it excels for *Dore-bars* and *bolts* ; and as of the *Elme*, so of this especially, they made even *hinges* and *books* to serve instead of *Iron*, and of the *Bark* is compos'd our *Bird-lime*.

18. Pill a good quantity of the *Bark* about *Midsummer*, fill a *Vessel* with it, and put to it *Spring-water* ; then boyle it, till the *grey* and *white bark* rise from the *green*, which will require neer 12 hours boiling; then taking it off the *fire*, separate the *barks*, the *water* first well drained from it : Then lay the *green bark* on the *Earth* in some coole *Vault* or *Cellar*, covering it with any sort of green and rank *weeds*, such as *Dock*, *Thistles*, *Hemlock*, &c. to a good thickness : Thus let it continue neer a *fort-night*, by which time 'twill become a perfect *mucilage*; then pound it all exceedingly in a stone *mortar* 'till it be a tough *past*, and so very fine, as no part of the *bark* be discernable : This done, *wash* it accurately well in some running stream of *Water*, as long as you perceive the least *ordure* or *motes* in it, and so reserve it in some *earthen* pot to purge and ferment, scuming it as often as any thing arises for four or five days, and when no more *filth* comes, change it into a *fresh* Vessel of earth, and reserve it for use, Thus : Take what quantity you please of it, and in an earthen *pipkin* add a *third* part of *Capons* or *Goose-grease* to it, well clarified ; or *Oyle* of *Walnuts* which is better : Incorporate these on a gentle *fire*, continually stirring it 'till it be *cold*, and thus your *Composition* is finish'd. But to prevent *Frosts* (which in severe weather will sometimes invade it on the *Rods*) take a quarter of as much *Oyle* of *Petroleum* as you do of *Grease*, and no cold whatever will congeale it. The *Italians* make their *Vischio* of the *Berries* of the *Misselto* of *Trees*, treated much after the same manner, but then they mix it with *Nut-Oyle* an ounce to a pound of *Lime*, and taking it from the *fire*, add half an ounce of *Terpentine* which qualifies it also for the *Water*. Great quantities of *Bird-lime* is brought to us out of *Turky*, and from *Damascus*, which some conceive to be made of *Sebestens*, finding sometimes the kernels : This *lime* is of a greener colour, subject to *Frosts*, and impatient of *Wet*, nor will

will last above a year or two good : Another sort comes also out of *Syria* of a yellow hue ; Likewise from *Spain*, whiter than the rest, will resist the water, but is of an ill sent. I have been told that the *Cortex* of our *Lantana* or *Wayfaring* shrub, will make as good *Bird-lime* as the best. But, let these suffice, being more than as yet, any one has publish'd. The superiour *Leaves* of *Holly Trees* dry'd to a fine powder, and drunk in *White-wine* is prevalent against the *Stone*, and cures *Fluxes* ; and a dozen of the mature *Berries* being swallow'd, purge *Phlegme* without danger.

Juniper.

19. Of *Juniper* we have three sorts, (Male, Female, Dwarf) whereof one is much taller, and more fit for Improvement : The wood is yellow, and sweet as *Cedar*, whereof it is accounted a *spurious* kind.

20. I have rais'd them abundantly of their seeds (neither wa-tring nor dunging the soile) which in two moneths will peep, and being govern'd like the *Cypress*, apt for all the employments of that beautiful Tree : To make it grow tall, prune and cleanse it to the very stem, the male best. The discreet loosening of the *Earth* about the *Roots* also makes it strangely to prevent your expectations by suddenly spreading into a bush fit for a thousand pretty Employments ; for coming to be much unlike that which grows wild, and is subject to the treading and cropping of *Cattle*, &c. it may be form'd into most beautiful and useful *Hedges* : My Brother having cut out of one onely Tree an *Arbour* capable for three to sit in : It was at my last measuring seven foot square, and eleven in height ; and would certainly have been of a much greater altitude and farther spreading, were it not continually kept shorn : But what is most considerable is the little time since it was planted, being yet hardly ten years, and then it was brought out of the *Common* a slender Bush of about two foot high : But I have experimented a proportionable improvement in my own Garden, where I do mingle them with *Cypresse*, and they perfectly become their stations. I wonder *Virgil* should condemn its shadow, I suspect him mis-reported : For,

21. The *Berries* afford (besides a tolerable *Pepper*) one of the most universal Remedies in the world to our crazy Forrester ; The *Berry* swallow'd onely, instantly appeaseth the *Wind-Collique*, and in decoction most sovereign against an inveterate Cough : They are of rare effect being steeped in *Beer*. The *Water* is a most singular *specificque* against the *Gravel* in the *Reins* ; But all is comprehended in the virtue of the *Theriacle* or *Electuary*, which I have often made for my poor Neighbours, and may well be term'd the Forrester's *Panaëa* against the *Stone*, *Rheume*, *Ptisie*, *Dropsie*, *Jaundies*, inward *Impostumes*, nay, *Palsie*, *Goute* and *Plague* it self taken like *Venice-Treacle*. Of the extracted Oyle (with that of *Nuts*) is made an excellent good Vernish for Pictures, for Wood-work and to preserve polish'd Iron from the rust. The Gum is good to rub on parchment to make it bear Ink, and the Coals, which are made of the Wood, endure the longest of any. See *Saint Hierom. ad Fabiolam* upon that expression *Psal.* 120. v. 4. If it arrive to full growth

growth it is *Timber* for many curious works; for *Tables*, *Chests*, small *Carvings* and *Images*, *Spoons*, wholesome to the *mouth*; *spits* to roast *meat* on, to which it gives a rare *taste*, but it should be old and dry wood; nay, I read of some large enough for *beams* and *rafters*. The very *Chips* render a wholesom *perfume* within doors, as well as the dusty *blossoms* in *Spring* without.

22. And since we now mention'd *Pepper*, it is by the most prudent, and princely care of his *Majesty* that I am assur'd of a late solemn *Act of Council*, enjoyning the preserving of that incomparable *Spice* which comes to us from *Jamaica* under that denomination; though in truth it be a mixture of so many *Aromatics* in one, that it might as well have been call'd *Cinnamon*, *Nutmeg* or *Mace*, to every of which it seems something *alied*: And that there is not onely prohibited the destruction of these *Trees* (for it seems some *Prodigals* us'd to cut them down for the more easie gathering) but order taken likewise for their *propagation*, and that *Assays* and *Samples* be from time to time sent over, what other *Fruits*, *Trees*, *Gums* and *Vegetables* may there be found, and which I prognostick will at last also incite his *Majesty*, and the *Planters* there to think of procuring *Cinnamon*, *Cloves* and *Nutmeg-trees* indeed from the *East-Indias*, and what other useful *Curiosities* will not approach our *Northern Beare* (and that are *incicrurables* amongst us) and to plant them in *Jamaica*, and other of his *Majesties Western Islands*, a more safe and frugal expedient to humble our *emulous Neighbours*; since there is nothing in their *Situation*, or defect of *Natures* benignity, which ought in the least to discourage us: And what if some of the *Trees* of those *Countrys* (especially such as aspire to be *Timber*, and may be of improvement amongst us) were more frequently brought to us likewise here in *England*; since we daily find how many rare *Exotics* and strangers with little care, become *endenizon'd*, and so contented to live amongst us, as may be seen in the *Platanus*, *Constantinople-Chest-nut*, the greater *Glandiferos Ilex*, *Cork*, *Nux Vesicaria* (which is an hard Wood fit for the *Turner*, &c.) the *Styrax*, *Bead tree*, the famous *Lotus*, *Virginian Acatia*, *Guaicum Patavinum*, *Paliurus*, *Cypress*, *Pines*, *Fir*, and sundry others, which grow already in our *Gardens* expos'd to the *Weather*; and so doubtless would many more: So judiciously observ'd is that of the learned *Author* of the *History* of the *Royal Society*, *Part. 3. Sect. 28.* 'That whatever attempts of this nature have succeeded, they have redounded to the great advantage of the *Undertakers*. The *Orange* of *China* being of late brought into *Portugal*, has drawn a great *Revenew* every year from *London* alone. The *Vine* of the *Rhene* taking root in the *Canaries*, has produc'd a far more delicious juyce, and has made the *Rocks* and *Sun-burnt Ashes* of those *Islands*, one of the richest spots of *Ground* in the *World*. And I will also instance in that which is now in a good forwardness: *Virginia* has already given *Silk* for the cloathing of our *King*; and it may happen hereafter to give *Cloathes* to a great part of *Europe*, and a vast *Treasure* to our *Kings*:

'*Kings*: If the *Silk-worms* shall thrive *there* (of which there seems 'to be no doubt) the profit will be inexpressible. We may guess 'at it, by considering what numbers of *Caravans*, and how many 'great *Cities* in *Persia* are maintain'd by that *Manufacture* alone, 'and what mighty *Customs* it yearly brings unto the *Sophi's* Revenue. Thus *He*; And to return to that of *Trees* and *Plants*, the Industry we have recommended, would questionless in less than halfe an *Age* produce us wonders, by introduction, if not of quite different; yet of better kinds, and such variety for pulchritude and sweetness; that when by some Princely Example, our late *Pride*, *Effeminacy* and *Luxurie* (which has to our vast charges excluded all the *Ornaments* of *Timber*, &c. to give place to *Hangings*, *Embroideries* and forrain *Leather*) shall be put out of Countenance, we may hope to see a new face of things for the encouragement of *Planters*, the more immediate Work of *Gods* hands; and the natural, wholesome, and ancient use of *Timber*, for the more lasting occasions and furniture of our *Dwellings*: And though I do not speak all this for the sake of *Joyne-stools*, *Benches*, *Cup-boards*, *Massy Tables* and *Gygantic Bed-steds*, the hospitable *Utensils* of our fore-Fathers; Yet I would be glad to encourage the *Carpenter* and the *Joyner*, and rejoyce to see, that their *Work* and *Skil* do dayly improve; and that by the Example and application of his *Majesties Universities*, and *Royal Society* the *Restauration* and *Improvement* of *Shipping*, *Mathematical* and *Mechanical Arts*, the use of *Timber* grows dayly in more reputation: And it were well if *Great Persons* might only be indulg'd to enrich and adorn their *Palaces* with *Tapistry*, *Damasc*, *Velvet*, and *Persian* furniture, whilst by some wholesom *Sump-tuary Laws*, the universal excess of those Costly and *Luxurious Moveables* were prohibited meaner Men, for divers politic Considerations and Reasons which it were easie to produce; but by a less influence than *severer Laws*, it will be very difficult, if not altogether impossible, to recover our selves from a softness and vanity which will in time not onely effeminate, but undo the Nation.

Laurel.

23. But to *Crown* all, I will conclude with the *Laurel*, which by the Use we commonly put it to, seems as if it had been only destin'd for *Hedges*, and to cover bare *Walls*; whereas, being planted upright, and kept to the *Standard*, by cutting away the collateral *Branches*, and maintaining one *stem*, it will rise to a very considerable *Tree*; and (for the first twenty years) resembling the most beautiful headed *Orange* in shape and verdure, arrive in time to emulate even some of our lusty *Timber-trees*; so as I dare pronounce the *Laurel* to be one of the most proper, and ornamental *Trees* for *Walks* and *Avenues* of any growing.

24. Pity it is they are so abus'd in the *Hedges*, where the lower *Branches* growing stickie and dry, by reason of their frequent and unseasonable cutting (with the genius of the *Tree*, which is to spend much in wood) they never succeed after the first six or seven years; but are to be new planted again, or abated to the very *Roots* for a fresh *shote*.

25. But

25. But would you yet improve the *Standard* which I celebrate, to greater and more speedy exaltation? bud your *Laurel* on the *Black-Cherry stock* to what height you please; if at least the report be true, which I had from an ocular testimony, and am now making an essay of, because I am more then somewhat doubtful of such *Alliances*, though something like it in *Palladius* speaks it not so impossible;

A Cherry Graft on Laurel-stock does stain
The virgin Fruit in a deep double grain.

Inseritur lauro Cerasus, parvūque coacta
Tingit adoptionis virginis ora pudor

26. They are rais'd of the *Seeds* or *Berries* with extraordinary facility, or propagated by *Layers Taleæ*, and *cuttings* where-ever there is shade and moisture. I find little concerning the *Mechanical uses* of the *Laurel*; but than its *Attributes* of old there was nothing more glorious and magnificent; For,

From Laurel chew'd the Pythian Priestess rose,
Events of future Actions to disclose.
Laurel Triumphant Generals did wear,
And Laurel Heralds in their hands did bear:
Poets ambitious of unfading praise,
Phœbus, the Muses all are crown'd with Bays.
And Vertue to her sons the Prize does name
Symbol of Glory, and immortal Fame.

Tu sacros Phœbi tripodas, in Sidera sentis,
Et casus aperis rerum præfaga futuros.
Te juvat armorum strepitus, clangorque Tubarum:
Perque acies medias, seque periculi belli,
Accendis bellantum animos; te Cynthia ipse,
Te Musa, Vatesque sacri optav' re Coronam:
Ipsa suis Virtus te spem proponit alumnis,
Tantum servatus valuit pudor, & bona fama.
Rapius.

I have now finish'd my *Planting*: A word or two concerning their *Preservation*, and the *Cure* of their *Infirmities*.

CHAP. XXVII.

Of the Infirmities of Trees.

THe Diseases of Trees are various, according to the Rustick *Infirmities*
Rhyme,

The Calf, the Wind-shoc and the Knot,
The Canker, Scab, Scurf, Sap and Rot.

Affecting the several parts: These invade the Roots; *Weeds*, *Suckers*, *Fern*, *Wet*, *Mice*, *Moles*, *Winds*, &c. to these may be added *Siderations* and even *Plagues*, *Tumors*, *Distortions*, *Lacrimations*, *Tophi*, *Goutes*, *Carbuncles*, *Ulcers*, *Crudities*, *Fungosities*, *Gangreens*, and an Army more, whereof some are hardly discernable; yet *Enemies*, which not foreseen, makes many a bargain of *standing wood* (though seemingly fair) very costly ware.

1. *Weeds* are to be diligently pull'd up by hand after *Rain*, whiles your *Seedlings* are very young, and till they come to be able to kill them with *shade* and *over-dripping*: And then are you for the obstinate to use the *Haw*, *Fork*, and *Spade*, to extirpate *Dog-grass*, *Bear-bind*, &c.

2. *Suckers* shall be duly eradicated, and with a sharp spade
T
dexterously

dexterously separated from the *Mother-roots*, and Transplanted in convenient places for *propagation*, as the *Season* requires.

3. *Fern* is best destroy'd by striking off the *Tops*, as *Tarquin* did the heads of the *Poppies*: This done with a good wand or cudgel, at the decrease in the *Spring*, and now and then in *Summer*, kills it in a year or two beyond the vulgar way of *Mowing*, or *burning*, which rather encreases than diminishes it.

4. Over-much *Wet* is to be drain'd by *Trenches*, where it infests the *Roots* of such kinds as require drier ground: But if a drip do fret into the body of a *Tree* by the head (which will certainly decay it) cutting first the place smooth, stop and cover it with *loam* and *hay* till a new bark succeed. These infest the *Bark*; *Bark-bound*, *Teredo*, or *Worm*, *Conys*, *Moss*, *Ivy*, &c.

5. The *Bark-bound* are to be releas'd by drawing your knife rind-deep from the *Root*, as far as you can conveniently; and if the gaping be much, filling the rift with a little *Cow-dung*; do this on each side, and at *Spring*, *February* or *March*; also cutting off some branches is profitable; especially such as are blasted or lightning-struck.

6. The *Teredo*, *Cossi*, and other *Worms*, lying between the *Body* and the *Bark*, poyson that passage to the great prejudice of some *Trees*; but the holes being once found, they are to be taken out with a light *Incision*; and the *Wood-pecker*, and other *Birds* often pitching upon the stem, as you may observe them, and knocking with their bills, is a mark that the *Tree* is infected, at least, between the *Bark*.

7. *Conies* and *Hares* by barking the *Trees* in hard *Winters*, spoil very many tender *Plantations*: Next to the utter destroying them, there is nothing better then to anoint that part which is within their reach, with *stercus humanum*, tempered with a little *Water* or *Urine*, and lightly brushed on; this renewed after every great *Rain*: But a cleaner than this, and yet which *Conies*, and even *Cattel* most abhor, is to water, or sprinkle them with *Tanners Lignor*, viz. That, which they use for dressing their hides.

8. *Moss* is to be rubb'd and scrap'd off with some fit instrument of *Wood*, which may not excorticate the *Tree*, or with a piece of *Hair-cloth* after a sobbing *Rain*: But the most infallible Art of *Emasculation* is taking away the cause, which is superfluous moisture in clayie and spewing grounds.

9. *Ivy* is destroy'd by digging up the *Roots*, and loosning its hold: And yet even *Ivy* it self, the destruction of many fair *Trees*, if very old, and where it has long invested its support, if taken off, does frequently kill the *Tree*, by a too suddain exposure to the unaccustom'd cold: Of the *Roots* of *Ivy* (which with small Industry, may be made a beautiful Standard) are made curiously polish'd and fleck'd cups and boxes, and even *Tables* of great value. *Mistle-to* and other *Excrescences* to be cut and broken off. But the *Fungi* (which prognosticate a fault in the *Liver* and *Entrails* of *Trees* as we may call it) is remedied by *Abrasion*, *Friktion*, *Interlucation* and exposure to the *Sun*.

10. The

10. The *Bodies of Trees* are visited with *Canker*, *Hollowness*, *Hornets*, *Earwigs*, *Snails*, &c.

11. The *Wind-shock* is a *bruise* and *shiver* throughout the *Tree*, though not constantly *visible*, yet leading the *Warp* from *smooth* *renting*; caused by over-powerful *Winds*, when young, and perhaps, by subtil *Lightnings*: The best prevention is *shelter*, choyce of *place* for the *Plantation*, frequent *shreading* whilst they are yet in their youth.

12. *Cankers* (caused by some *stroak* or *galling*) are to be *cut* out to the *quick*, the *scars* *emplastred* with *Tar* mingled with *Oil*, and over that a thin *spreading* of *loam*; or else with *clay* and *Horse-dung*; but best with *hogs-dung* alone, bound to it in a *rag*: or by laying *Wood-ashes*, *Nettles*, or *Fern* to the roots, &c. But if the *Gangreen* be within, it must be cured by *nitrous*, *sulphureous* and *drying* applications, and by no means, by any thing of an *unctious* nature, which is *exitial* to *Trees*. *Tar* as was said, only excepted, which I have experimentally known to preserve *Trees* from the *envenom'd* teeth of *Goats*, and other injuries; the *intire stem* *smar'd* over, without the least prejudice to my no small admiration.

13. *Hollowness* is contracted, when by reason of the ignorant or careless *lopping* of a *Tree* the *wet* is suffer'd to fall *perpendicularly* upon a part, especially the *Head*: In this case if there be sufficient *sound wood*, cut it to the *quick* and close to the body, and cap the *hollow* part with a *Tarpaulin*, or fill it with good *stiff loam*, and *fine hay* mingled. This is one of the worst of *Evils*, and to which the *Elm* is most obnoxious.

14. *Hornets* and *Wasps*, &c. by breeding in the *hollowness* of *Trees* infect them, and are therefore to be destroy'd by stopping up their entrances with *Tar* and *Goose-dung*, or by conveying the fumes of *brimstone* into their *Cells*.

15. *Earwigs* and *Snails* do seldom infect *Forest-trees*, but those which are *Fruit-bearers*, and are destroy'd by enticing them into sweet waters; and by picking the *Snails* off betimes in the *Morning*, and rainy *Evenings*: I advise you to visite your *Cypresse-Trees* on the first *Rains* in *April*; you shall sometimes find them cover'd with young *snails* no bigger than small *pease*: Lastly, *Branches*, *Buds*, and *Leaves* extreamly suffer from the *Blasts*, *Jaundies*, and *Caterpillars*, *Rooks*, &c.

16. The *blasted* parts of *Trees* are to be *cut* away to the *quick*; and to prevent it, *smoak* them in suspicious *weather*, by burning *moist straw* with the *wind*, or rather the *dry* and *superfluous cuttings* of *Aromatic plants*, such as *Rosemary*, *Lavender*, *Juniper*, *Bays*, &c. I use to whip, and chastise my *Cypresses* with a *wand*, after their *Winter-burnings*, 'till all the *mortified* and *scorch'd* parts flie off in *dust*, as long almost as any will *fall*, and observe that they *recover* and spring the better. *Mice*, *Moles*, and *Pismires* cause the *Jaundies* in *Trees*, known by the *discolour* of the *Leaves* and *Buds*.

17. The *Moles* may be taken in *Traps*, and kill'd, as every *Wood-*

man knows: It is certain that they are driven from their *haunts* by *Garlick* for a time, and other heady smells buried in their passages.

18. *Mice* with *Traps*, or by sinking some *Vessel* almost level with the surface of the ground, the *Vessel* half full of *Water*, upon which let there be strew'd some *hulls* or *chaff* of *Oates*; also with *Bane*.

19. Destroy *Pismires* with scalding water, and disturbing their *hills*, or rubbing the *stem* with *Cow-dung*, or a decoction of *Tithymale*, washing the infested parts; and this will insinuate, and chase them quite out of the *chinks* and *crevices*, without prejudice to the *Tree*, and is a good prevention of other *Infirmities*.

20. *Caterpillars*, by cutting off their *webs* from the twigs before the end of *February*, and burning them; the sooner the better: If they be already *hatched* wash them off with *Water*, in which some of the *Caterpillars* themselves, and *Garlick* have been bruised, or the *juice* of *Rue*, or *choak* and dry them with *smoak* of *Galbanum*, *Shoe-soles*, *Hair*, and some affirm that planting the *Pionie* near them is a certain *remedy*; but there is no *remedy* so facile as the burning them off with small wisps of dry *straw*, which in a moment rids you.

21. *Rooks* do in time, by pinching off the *buds* and tops of *Trees* for their *Nests*, cause many *Trees* and *Groves* to decay: But if *Cattel* break in before the time, *conclamatum est*, especially *Goats*, whose mouths and breath is *poysen* to *Trees*; they never thrive well after, and *Varro* affirms, if they but lick the *Olive* tree, they become immediately barren.

22. Another touch at the *Winds*; For though they cannot properly be said to be *Infirmities* of *Trees*; yet they are amongst the principal *causes* that render *Trees* infirm. I know no surer protection against them, than (as we said) to *shelter* and *stake* them whilst they are *young*, 'till they have well establish'd *Roots*; And with this *caution*, that in case any goodly *Trees* (which you would desire especially to preserve and redress) chance to be prostrated by some impetuous and extraordinary *storme*; you be not over hasty to carry him away, or despair of him; but first let me persuade you to *poll* him close, and so let him lye some time; for by this means many vast *Trees* have *rain'd* themselves by the vigour onely of the remaining *Roots*, without any other assistance; so as people have pronounc'd it *Miraculous*, as I could tell you by several *Instances*; besides what *Theophrastus* relates c. 19. of that huge *Platanus*, which rise in one *Night* in his observation; and the like I find hapn'd in more than one *Tree* near *Bononia* in *Italy*, *An. 1657*. when of late a turbulent *Gust* had almost quite irradicated a very large *Tract* of huge *Poplars*, belonging to the *Marchioness Elephanta-tucca Spada*, that universally erected themselves again after they were beheaded as they lay even prostrate: What says the Naturalist? *Prostratas restitui plerunque, & quadam terra cicatrice reviviscere vulgare est*: 'Tis familiar (says *Plinie*) in the *Platanus*, which

which are very obnoxious to the *Winds*, by reason of the thicknesse of their branches, which being cut off, and discharged, restore themselves. This also frequently happens in *Wall-nuts*, *Olive-trees*, and several others, as he affirms; *l. 16. c. 31.* These (amongst many others) are the *Infirmities* to which *Forest-Trees* are subject whilst they are standing; and when they are *fell'd*, to the *Worm*; especially if *cut* before the *Sap* be perfectly at rest: But to *prevent* or *cure* it in the *Timber*, I recommend this *Secret* as the most approv'd.

23. Let common yellow *Sulphur* be put into a *cucurbit-glass*, upon which pour so much of the strongest *Aqua fortis* as may cover it three fingers deep: *Distil* this to dryness, which is done by two or three *Rectifications*: Let the *Sulphur* remaining in the bottom (being of a blackish or sad red colour) be laid on a *Marble*, or put into a *Glass*, where it will easily dissolve into *Oil*: With this anoint what is either infected or to be preserved of *Timber*. It is a great and excellent *Arcanum* for tinging the *Wood* with no unpleasant colour, by no Art to be washed out; and such a preservative of all manner of *Woods*, nay, of many other things; as *Ropes*, *Cables*, *Fishing-Nets*, *Masts of Ships*, &c. that it defends them from *putrefaction*, either in *Waters*, under, or above the earth, in the *Snow*, *Ice*, *Air*, *Winter* or *Summer*, &c. It were superfluous to describe the process of the *Aqua-fortis*; It shall be sufficient to let you know, That our common *Copras* makes this *Aqua-fortis* well enough for our purpose, being drawn over by a *Retort*: And for *Sulphur* the *Island of Saint Christophers* yields enough, (which hardly needs any *Refining*) to furnish the whole world. This *Secret* (for the *Curious*) I thought fit not to omit; though a more compendious, three or four anointings with *Linseed Oil*, has prov'd very effectual: It was experimented in a *Wall-nut Table*, where it destroy'd millions of *Worms* immediately, and is to be practis'd for *Tables*, *Tubes*, *Mathematical Instruments*, *Boxes*, *Bed-steads*, *Chairs*, *Rarities*, &c. *Oyl of Wall-nuts* will doubtless do the same, is sweeter, and a better *Vernish*; but above all is commended *Oyl of Cedar*, or that of *Juniper*.

24. Hitherto I have spoken of *Trees*, their *kinds*, and *propagation* in particular: Now a word or two concerning their *ordering* in general, as it relates to *Coppes*, *Lopping*, *Felling*, &c. Then I shall add something more concerning their *Uses*, as to *Fuel*, &c. and cast such accidental *Lessons* into a few *Aphorisms*, as could not well be more regularly inserted.

Lastly, I shall conclude with some more serious *Observations* in reference to the main *Design* and project of this *Discourse*, as it concerns the *Improvement* of his *Majesties Forests*, for the *honour* and security of the whole *Kingdom*.

CHAP. XXVIII.

Of Coppes.

coppes.

1. *Sylva Cœdua* is (as *Varro* defines it) as well *Copse* to cut for fuel as for use of *Timber*; and we have already shew'd how it is to be rais'd, both by *Sowing* and *Planting*. I shall onely here add, that if in their first *Designation*, they be so laid out, as to grow for several *Falls*; they will both prove more profitable, and most delightful: Most profitable, because of their annual *Succession*; and most pleasant, because there will always remain some of them standing; and if they be so cast out, as that you leave strait, and even *Intervals* of eighteen, or twenty foot for *grasse*, between *Spring-wood* and *Spring-wood*, securely *Fenc'd*, and preserv'd; the *Pastures* will lye both warm, and prove of exceeding delight to the Owner. These *Spaces* likewise useful and necessary for *Cart-way*, to fetch out the wood at every *Fall*. There is not a more noble, and worthy *Husbandry*, than is this, which rejects no sort of *Ground*, as we have abundantly shew'd; since even the most boggy places, may so be drein'd and cast, as to yield its increase, by *Planting* the dryer sorts upon the *Ridges* and banks which you cast up, where they will thrive exceedingly: And then *Willow*, *Sallow*, *Alder*, *Poplar*, *Sycamor*, &c. will shoot tollerably well on the lower and more *Uliginous*; with this caution, that for the first two years, they be kept diligently weeded and clenched, which is as necessary as *fencing* and guarding from *Cattel*. Our ordinary *Coppes* are chiefly upon *Hasel*, or the *Birch*; but if amongst the other kinds store of *Ash*, *Chestnut*, and *Sallow* (at least one in four) were sprinkled in the *Planting*, the profit would soon discover a difference, and well recompence the industry. Others advise us to *Plant* shoots of *Sallow*, *Willow*, *Alder*, and of all the swift growing *Trees*, being of seven years growth, sloping off both the ends towards the ground, to the length of a *Billet*, and burying them a reasonable depth in the earth. This will cause them to put forth seven or eight branches, each of which will become a *Tree* in a short time, especially, if the soil be moist. The neereft distance for these *Plantations* ought never to be lesse than five foot at first, since every *felling* renders them wider for the benefit of the *Timber*, even to thirty and forty foot in five or six *fellings*.

2. Though it be almost impossible for us to prescribe at what Age it were best *Husbandry* to fell *Coppes* (as we at least call best *Husbandry*) that is, for most, and greatest gain; since the *Mercats*,
'and

and the *kinds* of *Wood*, and emergent *uses* do so much govern; yet *Copses* are sometimes of a competent stature after *eight* or *nine* years from the *Acorn*, and so every *eight* or *ten* years successively, will rise better and better: But this had need be in extraordinary ground, otherwise you may do well to allow them *twelve* or *fifteen* to fit them for the *Ax*; but those of *twenty* years standing are better, and far advance the price; especially if *Oke*, and *Asb*, and *Cheffnut* be the chief furniture. Some of our old *Clergy* *Spring-Woods* heretofore have been let rest till twenty five or thirty years, and have prov'd highly worth the attendance; for by that time even a *Seminary* of *Acorns* will render a considerable advance, as I have already exemplified in the *Northamptonshire Lady*. And if *Copses* were so divided as that every year there might be some *fell'd*, it were a continual, and a present Profit: Seventeen years growth affords a tolerable *Fell*; supposing the *Copse* of seventeen *Acres*, one *Acre* might be yearly *fell'd* for ever; and so more, according to proportion; but the seldom *Fall* yields the more *Timber*.

3. As to what *Numbers* and *Scantlings* you are to leave on every *Acre*, the *Statutes* are our general *guides*, at least the *legal*. It is a very ordinary *Copse* which will not afford three or four *Firsts*, that is, *Bests*; fourteen *Seconds*, twelve *Thirds*, eight *Wavers*, &c. according to which *proportions* the sizes of young *Trees* in *Copling* are to succeed one another. By the *Statute* of 35 *Hen. 8.* in *Copses* or *Under-woods* *fell'd* at twenty four years growth, there were to be left twelve *Standils*, or *stores* of *Oak*, upon each *Acre*; in defect of so many *Oaks*, the same number of *Elms*, *Asb*, *Asp*, or *Beech*; and they to be such as are of likely *Trees* for *Timber*, and of such as have been spar'd at some former *Felling*, unless there were none, in which case they are to be then left, and so to continue without *Felling* till they are *ten inch square* within a *yard* of ground. *Copses* above this growth *fell'd*, to leave twelve great *Oaks*; or in defect of them other *Timber-trees* (as above) and so to be left for twenty years longer, and to be enclosed seven years.

4. In summe, you are to spare as many likely *Trees* for *Timber* as with discretion you can. And as to the felling (beginning at one side, that the *Carts* may enter without detriment to what you leave standing) the *Under-wood* may be cut from *January* at the latest, till mid-*March*, or *April*; or from mid-*September*, till neer the end of *November*; so as all be avoided by *Midsummer* at the latest, and then *fenced* (where the *Rows* and *brush* lye longer unbound or made up, you endanger the losse of a *second Spring*) and not to stay so long as usually they are a *clearing*, that the *young*, and the *Seedlings* may suffer the least interruption: And if the *Winter* previous to your felling *Copses*, you preserve them well from *Cattel*, it will recompense your care.

5. It is advis'd not to cut off the *browse-wood* of *Oaks* in *Copses*, but to suffer it to fall off, as where *Trees* stand very close it usually does: I do not well comprehend why yet it should be spar'd so long.

6. When

6. When you espy a *cluster* of *Plants* growing as it were all in a bunch, it shall suffice that you preserve the fairest *Sapling*, cutting all the rest away. And if it chance to be a *Chest-nut*, *Service*, or like profitable *Tree*, clear it from the droppings and incumbrances of other *Trees*, that it may thrive the better : Then as you passe along, *prune*, and *trim* up all the young *Wavers*, covering such *Roots* as lye bare and expos'd, with fresh mould.

7. Cut not above *half* a foot from the *Ground*, and that to the *South* slopewise ; *stripping* up such as you spare from their extravagant *branches*, *water-boughs*, &c. that hinder the growth of others : Always remembring (before you so much as enter upon this work) to preserve sufficient *Plash* pole about the *verge* and bounds of the *Copse* for *fence*, and security of what you leave ; and for this something lesse than a *Rod* may suffice : Then *raking* your *Wood* clear of *Spray*, *Chips*, and all *incumbrances*, shut it up from the *Cattel* ; the longer the better.

8. By the *Statute* Men were bound to enclose *Copses* after *Felling*, of or under fourteen years growth for four years : Those above fourteen years growth to be sixteen years *Enclos'd* ; And for *Woods* in *common*, a fourth part to be shut up ; and at *Felling* the like proportion of great *Trees* to be left, and seven years *Enclos'd* : This was enlarg'd by 13 *Eliz.* Your elder *Under-woods* may be *graz'd* about *July* : But for a general *Rule*, newly-weaned *Calves* are the least noxious to newly-cut *Spring-woods*, where there is abundance of *Grasse* ; and some say, *Colts* of a year old ; but then the *Calves* must be driven out at *May* at farthest, though the *Colts* be permitted to stay a while longer : But of this every mans experience will direct him ; and surely the later you admit *Beasts* to *graze*, the better. For the *Measure* of *Fuel* these proportions were to be observ'd.

9. Statutable *Billet* should hold three foot in length, and seven inch and half *compasse* ; ten or fourteen as they are counted for one, two, or three, &c. A *Stack* of *Wood* (which is the *boughs* and *offal* of the *Trees* to be converted to *Char-coal*) is four yards long, three foot and half high (in some places but a *yard*) and as much over : In other places the *Cord* is four foot in height, and four foot over ; or (to speak more *Geometrically*) a *Solid* made up of three *dimensions*, four foot high, four foot broad, and eight foot long ; the *content* 128 cubique feet. *Fagots* ought to be a full *yard* in length, and two foot in *circumference*, made *round*, and not *flat* ; for so they contain lesse *Fuel*, though equal in the bulk appearing. But of these *particulars* when we come to speak expressly of *Fuel*.

10. In the mean time it were to be wish'd, that some approv'd *Experiments* were sedulously try'd (with the advice of skillful and ingenious *Physicians*) for the making of *Beer* without *Hopps* ; as possibly with the white *Marrubium* (a Plant of singular virtue) or with dry'd *Heath-tops* (*viz.* that sort which bears no *berries*) or the like far more wholesom, and lesse bitter than either, *Tamarisk*, *Carduus*, or *Broom*, which divers have essay'd ; it might prove a means

means to save a world of *Fuel*, and in divers places young *Timber* and *Copse-wood*, which is yearly spent for *Poles*; especially in Countries where *Wood* is very precious.

Note, that the *Wood-land-measure* by *Statute*, is computed after eighteen foot the *Perch*.

CHAP. XXIX.

Of Pruning.

1. **P**RUNING I call all purgation of *Trees* from what is superfluous. The *Ancients* found such benefit in *Pruning*, that they feigned a *Goddeſſe* praſided over it, as *Arnobius* tells us: And in truth, it is in the diſcreet performance of this *work*, that the improvement of our *Timber* and *Woods* does as much conſiſt as in any thing whatſoever. A ſkillful *Planter* ſhould therefore be early at this *Work*: Shall old *Gratius* give you *Reason* and *Direction*?

Pruning.

And his incomparable *Interpreter* thus in *Engliſh*.

Twigs of themſelves never riſe ſtrait and high,
And Under-woods are bow'd as firſt they ſhoot,
Then prune the *Boughs*; and *Suckers* from the root
Diſcharge. The leavyy wood fond pity tires,
After, when with tall rods the Tree aſpires,
And the round ſtaves to Heaven advance their twigs,
Pluck all the buds, and ſtrip off all the ſprigs;
Theſe iſſues vent what moiſture ſtill abound,
And the veins unemploy'd grow hard and ſound.

Waſe.

Nunquam ſponte ſua procerus ad æra terminus
Exit, inque ipſa curvantur ſtirpe genitila.
Ergo age luxuriam primo ſectusque nocentem
Detrahe: frondosæ gravat indulgentia ſilvæ.
Poſt ubi proceris generoſa ſtirpibus arbor
Se dederit, tæretique ferent ad ſidera virga,
Stringe notas circum, & gemmantem exige verſus.
Hic, ſi quis vitium nociturus ſufficit humor,
Viſceribus ſuit, & venas durabit inertes.

Gra. ſal.
Cynæget.

2. For 'tis a miſery to ſee how our faireſt *Trees* are deſac'd, and mangl'd by unſkilful *Wood-men*, and miſchievous *Bordurers*, who go alwayes arm'd with ſhort *Hand-bills*, hacking and chopping off all that comes in their way; by which our *Trees* are made full of *knots*, *boils*, *cankers*, and deform'd bunches, to their utter deſtruction: Good *Huſbands* ſhould be aſham'd of it; though I would have no *Wood-man* pretend to be without all his neceſſary *Furniture*, when he goes about this *work*; which I (once for all) reckon to be the *Hand bill*, *Hatchet*, *Hook*, *Hand ſaw*, an excellent *Pruning-Knife*, broad *Chizel* and *Mallet*, all made of the beſt ſteel and kept tharp; And thus he is provided for greater, or more gentle *Executions*, *Purgations*, *Reciſions*, and *Coerſions*; and it is of main concern, that the proper and effectual *Tool* be apply'd to every *work*; ſince heavy and rude *Inſtruments* do but mangle and bruife tender *Plants*; and if they be too ſmall, they cannot make cleer and even *work* upon great *arms* and *branches*: The *Knife* is for

U

Twigs

Twigs and Spray; The *Chizel* for larger *Armes*, and such *Amputations* as the *Ax*, and *Bill* cannot well operate upon. As much to be reprehended are those who either begin this work at unseasonable times, or so maim the poor *branches*, that either out of laziness, or want of skill, they leave most of them *stubs*, and instead of cutting the *Arms* and *Branches* close to the *boal*, hack them off a foot or two from the body of the *Tree*, by which means they become *hollow* and *rotten*, and are as so many *Conduits* to receive the *Rain* and the *Weather*, which perishes them to the very *Matrix* and *Heart*, deforming the whole *Tree* with many ugly *botches*, which shorten its life, and utterly marre the *Timber*: I know Sir H. Platt tells us, the *Elm* should be so *lopp'd*, but he says it not of his own *Experience* as I do.

3. By this *Animadversion* alone it were easie for an ingenious man to understand how *Trees* are to be govern'd; which is in a word, by cutting *clean*, *smooth*, and *close*, making the stroke *upward*, and with a sharp *Bill*, so as the weight of an untractable *bough* do not *splice*, and carry the *bark* with it, which is both dangerous and unsightly. The *Oak* will suffer it self to be made a *Pollard*, that is, to have its *Head* quite cut off; but the *Elm* so treated, will perish to the *foot*, and certainly become hollow at last, if it scape with life.

4. The proper Season for this work is for old *Trees* *earlier*, for young *later*, as a little after the change in *January* or *February*, some say in *December*:

Then shave their locks, and cut their branchy tressie
Severely now, luxuriant boughs repressie.

— Tunc stringe comas, tunc brachia tonda:
— Tunc denique dura
Exerce Imperia, & ramos compescis flouentes.

Georg. 2.

But this ought not to be too much in young *Fruit-trees*, after they once come to form a handsom *bead*; in which period you should but onely pare them over about *March*, to cover the *stock* the sooner, if the *Tree* be very choice: To the *aged*, this is plainly a renewing of their *Youth*, and an extraordinary refreshment, if taken in *time*, and that their *Armes* be not suffer'd to grow too great and large: Besides, for *Interlucation*, exuberant branches, & *spissa nemorum coma*, where the *boughs* grow too thick and are cumbersome, to let in the *Sun* and *Air*, this is of great importance; and so is the sedulous taking away of *Suckers*, *Water-boughs*, *Fretters*, &c. And for the benefit of tall *Timber*, the due *stripping up* the branches, and *rubbing* of the *buds* to the heights you require: Yet some do totally forbear the *Oak*, especially if *aged*, observing that they much exceed in growth such as are *prun'd*; and in truth such *Trees* as we would leave for *shade*, and ornament, should be seldom cut; but the *browse-wood* cherish'd, and preserv'd as low towards the Ground as may be, for a more venerable and solemn *shade*: and therefore I did much prefer the *walk* of *Elms* at S. James's Park, as it lately grew *branchy*, intermingling their reverend tresses, before the present trimming them up so high; especially, since I fear, the *remedy* comes

too

too late to save their decay, if the amputations of such over-grown parts as have been cut off, should not rather accelerate it, by exposing their large and many *wounds* to the injuries of the weather, which will indanger the *rotting* of them, beyond all that can be apply'd by *Tar*, or otherwise to protect them : I do rather conceive their Infirmities to proceed from what has not long since been abated of their large spreading Branches, to accommodate with the *Mall*; as any one may conjecture by the great impression which the *wet* has already made in those incurable scarrs, that being now multiplied, must needs the sooner impair them : The *roots* having likewise infinitely suffer'd, by many disturbances about them. In all events this *VValk* might have enjoy'd its goodly Canopy with all their branchy furniture for some *Ages* to come; since 'tis hardly *one*, that first they were planted : But his *Majestie* will have providently, and nobly supplied this *defect*, by their successors of *Lime-trees*, which will sooner accomplish their perfection.

5. Divers other precepts of this nature I could here enumerate, had not the great *experience*, faithful, and accurate *description* how this necessary *work* is to be perform'd, set down by our Countryman honest *Lawson* (*Orchard, cap. 11.*) prevented all that the most *Inquisitive* can suggest : The particulars are so ingenious, and highly material, that you will not be displeas'd to read them in his own style.

All ages (saith he) by Rules and experience do consent to a pruning, and lopping of Trees : Yet have not any that I know described unto us (except in dark, and general words) what, or which are those superfluous boughs, which we must take away; and that is the most chief, and most needful point to be known in lopping. And we may well assure our selves (as in all other Arts, so in this) there is a bantage and dexterity by skill; an habit by practice out of experience, in the performance hereof, for the profit of mankind : Yet do I not know (let me speak it with patience of our cunning Arborists) any thing within the compasse of humane affairs so necessary, and so little regarded; not onely in Orchards, but also in all other Timber-trees, where, or whatsoever.

Now to our purpose :

How many Forests, and Woods, wherein you shall have for one lively thriving Tree, four (nay sometimes twenty four) evil thriving, rotten and dying Trees, even whiles they live; and instead of Trees, thousands of bushes and shrubs? what rottenness? what hollownesse? what dead arms? wither'd tops? curtail'd trunks? what loads of Moss? drooping boughs? and dying branches shall you see every where? and those that in this sort are in a manner all unprofitable boughs, canker'd armes, crooked, little and short boals. What an infinite number of Bushes, Shrubs, and Skrags of Haws, Thornes, and other unprofitable wood, which might be brought by dressing to become

great, and goodly Trees? Consider now the Cause.

The lesser Wood hath been spoil'd with careless, unskillfull, and untimely felling; and much also of the great Wood. The greater Trees at the first rising have fill'd and overladen themselves with a number of wasteful boughs and suckers, which have not onely drawn the sap from the boal, but also have made it knotty, and themselves, and the boal mossie, for want of dressing; whereas, if in the prime of growth, they had been taken away close, all but one top, and clean by the bulk, the strength of all the sap should have gone to the bulk, and so he would have recovered, and cover'd his knots, and have put forth a fair, long, and straight body, for Timber profitable, huge great of bulk, and of infinite last.

If all Timber-trees were such (will some say) how should we have crooked wood for Wheels, Coprbs, &c?

Ans. Dresse all you can, and there will be enough crooked for those uses.

More than this; in most places they grow so thick, that neither themselves, nor earth, nor any thing under or near them can thrive; nor Sun, nor Rain, nor Air can do them, nor any thing near, or under them, any profit or comfort.

I see a number of Hags, where out of one root you shall see three or four (nay more, such is mens unskillful greediness, who desiring many, have none good) pretty Oaks, or Ashes straight and tall; because the root at the first shoot gives sap again: But if one onely of them might be suffer'd to grow, and that well, and cleanly prun'd, all to his very top, what a Tree should we have in time? And we see by those roots continually, and plentifully springing, notwithstanding so deadly wounded, what a Commodity should arise to the Owner, and the Commonwealth if wood were cherish'd, and orderly dress'd. The waste boughs closely, and skillfully taken away, would give us store of Fences and Fuel; and the bulk of the Tree in time would grow of huge length and bignesse: But here (methinks) I hear an unskillful Arborist say, that Trees have their several forms, even by Nature; the Pear, the Holly, the Aspe, &c. grow long in bulk, with few and little Arms. The Oak by nature broad, and such like. All this I grant: But grant me also, that there is a profitable end and use of every Tree, from which if it decline (though by nature) yet Man by Art may (nay must) correct it. Now other end of Trees I never could learn, than good Timber, Fruit much and good, and pleasure: Uses Physical hinder nothing a good form.

Neither let any Man ever so much as think, that it is unprofitable, much lesse impossible, to reform any Tree of what kind soever: For (believe me) I have tried it: I can bring any Tree (beginning betime) to any form. The Pear, and Holly may be made spread, and the Oak to close.

Thus

Thus far the good *Man* out of his *eight* and *forty* years *experience* concerning *Timber-trees*: He descends then to the *Orchards*; which because it may likewise be acceptable to our industrious *Planter*, I thus contract.

6. Such as stand for *Fruits* should be parted from within two foot (or thereabouts) of the earth; so high, as to give liberty to dress the *Root*, and no higher; because of exhausting the *sap* that should feed his *Fruit*: For the *boal* will be first, and best served and fed, being next to the *root*, and of greatest substance. These should be parted into two, three, or four *Arms*, as your *graff's* yield twigs; and every *Arm* into two, or more *Branches*, every *Branch* into his several *Cyons*: still spreading by equal degrees; so as his *lowest* spray be hardly without the reach of a mans *hand*, and his *highest* not past two yards higher: That no *twig* (especially in the midst) touch his fellow; let him spread as far as his list without any master-bough, or top, equally; and when any fall lower then his fellows (as they will with weight of *Fruit*) ease him the next *spring* of his superfluous *twigs*, and he will rise: When any mount above the rest, *top* him with a *nip* between your *fingers*, or with a *knife*: Thus reform any *Cyon*; and, as your *Tree* grows in *stature*, and *strength*, so let him rise with his tops, but slowly, and easily; especially in the midst, and equally in breadth also; following him upward, with lopping his under-growth, and *water-boughs*, keeping the same distance of *two yards*, not above *three*, in any wise, betwixt the lowest and highest twigs.

1. Thus shall you have handsome, clear, healthful, great and lasting *Trees*.

2. Thus will they grow safe from *Winds*, yet the top spreading.

3. Thus shall they bear much *Fruit*; I dare say, one as much as five of your common *Trees*, all his branches loaden.

4. Thus shall your *Boal* being low, defraud the branches but little of their *sap*.

5. Thus shall your *Trees* be easie to *dress*, and as easie to gather the *Fruit* from, without bruising the *Cyons*, &c.

6. The fittest time of the *Moon* for the *Pruning* is (as of *Grafting*) when the *sap* is ready to stir (not proudly stirring) and so to cover the *wound*; and here, for the time of *day*, we may take *Columella*, *Frondem medio die arborator ne cadito. l. 11.* Old *Trees* would be prun'd before young *Plants*: And note, that wheresoever you take any thing away, the *sap* the next *Summer* will be putting; be sure therefore when he puts to bud in any unfit place, you rub it off with your finger: Thus begin *timely* with your *Trees*, and you may bring them to what form you please. If you desire any *Tree* should be taller, let him *break*, or divide higher: This for young *Trees*: The *old* are reformed by curing of their *diseases*, of which we have already discours'd. There is this only to be consider'd, in reference to *Foresters*, out of what he has spoken concerning *Fruit-trees*; (that as has been touch'd) where *Trees* are planted for shadow,

dow, and meer ornament, as in *Walks*, and *Avenues*, the *Browse-wood* (as they call it) should most of it be cherished; whereas in *Fruit*, and *Timber-trees* (*Oak* excepted) it is best to free them of it: As for *Pollards* (to which I am no great friend, because it makes so many *scrags* and *dwarfs* of many *Trees* which would else be good *Timber*, endangering them with *drips* and the like *injuries*) they should not be *headed* above once in ten or twelve years, at the beginning of the *Spring*; or end of the *Fall*. And note, that all *Copping*, and cutting *close*, invigorates the *Roots*, and the *stem* of whatsoever grows *weak* and *unkindly*; but you must then take care it be not *overgrown* with *Weeds* or *Grasse*: Nothing (says my Lord Bacon *Exp.* 586. and truly) causes *Trees* to last so long, as the frequent *Cutting*; every such *diminution* being a *re-invigoration* of the *Plants* *juyce*, that it neither goes too far, nor rises too faintly, as when 'tis not timely refresh'd with this *Remedy*; and therefore we see, that the most ancient *Trees* in *Church-Yards*, and about *Old Buildings*, are either *Pollards* or *Dottards*, seldom arising to their full altitude.

7. For the improvement of the speedy growth of *Trees*, there is not a more excellent thing then the frequent *rubbing* of the *Boal* or *Stem*, with some piece of *hair-cloth*, or ruder stuff, at the beginning of *Spring*: some I have known done with *Seals-skin*; the more rugged bark with a piece of *Coat of Maile*, which is made of small *myres*; this done, when the body of the *Trees* are wet, as after a soaking *Rain*; yet so, as not to *excorticate*, or gall the *Tree*, has exceedingly accelerated its growth, (I am assured, to a wonderful and incredible improvement) by opening the *pores*, freeing them of *moss*, and killing the *worm*.

8. Lastly, *Froncation* or the taking off some of the luxuriant *branches*, and *sprays*, of such *Trees*, especially whose leaves are profitable for *Cattel* (whereof already) is a kind of *pruning*: and so is the *scarifying*, and *cross hatching* of some *Fruit-bearers*, and others, to abate that *ovulation* which spends all the *juyce* in the *leaves*, to the prejudice of the rest of the parts.

9. This, and the like, belonging to the care of the *Wood-ward*, will mind him of his continual duty; which is to walk about, and survey his young *Plantations* dayly; and to see that all *Gaps* be immediately stopp'd; trespassing *Cattle* impounded; and (where they are infested) the *Deer* chased out, &c. It is most certain, that *Trees* preserv'd, and govern'd by this *discipline*, and according to the *Rules* mention'd, would increase the beauty of *Forests*, and value of *Timber*, more in ten, or twelve years, than all other imaginable *Plantations* (accompanied with our usual neglect) can do in forty or fifty.

10. To conclude, in the time of this *Work* would our ingenious *Arborator* frequently *incorporate*, mingle, and unite the *Arms* and *Branches* of some young, and flexible *Trees* which grow in *confort*, and neer to one another; by entering them into their mutual *barks* with a convenient *infision*: This, especially, about *Fields*,
and

and Hedge-rows for Fence and Ornament; also by bowing, and bending of others, especially Oak and Ash, into various flexures, curbs and postures, oblig'd to ply themselves into different Modes, which may be done by humbling and binding them down with rough bands and withs, or hooks rather, cut Skew-wise, or slightly bagled and indented with a knife, and so skrewed into the ground, till the tenor of the sap, and custom of being so constrain'd, did render them apt to grow so of themselves, without power of redressing; This course would wonderfully accommodate Materials for Knee-timber and Shipping, the Wheel-wright and other uses; conform it to their Moulds, and save infinite labour, and abbreviate the work of hewing and waste,

— *adco in teneris consuescere multum est.*

the Poet, it seems, knew it well, and for what purposes,

When in the woods with mighty force they bow
The Elme, and shape it to a crooked plow.

*Continuò in Sylvis magna vi flexa domatur
In burim, & curvi formam accipit Ulmus aratri:*
Geo. 1.

so as it even half made it to their hands.

CHAP. XXX.

Of the Age, Stature, and Felling of Trees.

I. **I**T is not till a Tree is arriv'd to his perfect Age, and full vigor, Felling: that the Lord of the Forest should consult, or determine concerning a Felling. For there is certainly in Trees (as in all things else) a time of Increment, or growth; a Status or season when they are at best (which is also that of Felling) and a decrement or period when they decay. To the first of these they proceed with more, or less velocity, as they consist of more strict and compacted particles, or are of a sligher, and more laxd contexture; by which they receive a speedier, or slower defluetion of Aliment: This is apparent in Box, and Willow; the one of a harder, the other of a more tender substance: But as they proceed, so they likewise continue. By the state of Trees I would signifie their utmost effort, growth, and maturity, which are all of them different as to time, and kind; yet do not I intend by this any period or instant in which they do not continually either Improve or Decay (the end of one being still the beginning of the other) but farther than which, their Natures do not extend; but immediately (though to our senses imperceptibly) through some infirmity (to which all things sublunary be obnoxious) dwindle and impair, either through Age, defect of Nourishment, by sickness, and decay of principal parts; but

but especially, and more inevitably, when violently invaded by mortal and incurable *Infirmities*, or by what other extinction of their native *heat*, *subtraction*, or *obstruction* of *Air* and *Moisture*, which making all *motions* whatsoever to cease and determine, is the cause of their final destruction.

2. Our honest *Countrey-man*, to whose *Experience* we have been obliged for something I have lately *Animadverted* concerning the *Pruning* of *Trees*, does in another *Chapter* of the same *Treatise*, speak of the *Age* of *Trees*. The *Discourse* is both learned, rational, and full of encouragement: For he does not scruple to affirm, That even some *Fruit-Trees* may possibly arrive to a *thousand* years of *Age*; and if so *Fruit-Trees*, whose continual bearing does so much impair and shorten their lives, as we see it does their form and beauty; How much longer might we reasonably imagine some hardy and slow-growing *Forest-trees* may probably last; I remember *Pliny* tells us of some *Oaks* growing in his time in the *Hercynian Forest*, which were thought *co-evous* with the *World* it self; their roots had even raised *Mountains*, and where they encounter'd, swell'd into goodly *Arches* like the *Gates* of a *City*: But our more modern *Author's* calculation for *Fruit-trees* (I suppose he means *Pears*, *Apples*, &c. his allowance is *three hundred* years for *growth*, as much for their *stand* (as he terms it,) and *three hundred* for their *Decay*, which does in the total amount to no less than *nine hundred* years. This conjecture is deduc'd from *Apple-Trees* growing in his *Orchard*, which having known for *fourty* years, and upon diligent enquiry of sundry aged Persons of *eighty* years and more, who remembred them *Trees* all their time, he finds by comparing their growth with others of that *kind*, to be far short in bigness and perfection, (*viz.* by more then two parts of three) yea albeit those other *Trees* have been much hindered in their stature, through ill government and mis-ordering.

3. To establish this, he assembles many *Arguments* from the age of *Animals*, whose *state* and *decay* double the time of their *increase* by the same proportion: If then (saith he) those *fraile* Creatures, whose bodies are nothing (in a manner) but a tender rottenness, may live to that age; I see not but a *Tree* of a *solid* substance, not damaged by heat or cold, capable of, and subject to any kind of ordering or dressing, feeding naturally, and from the beginning disburthen'd of all superfluities, eased of, and of his own accord avoiding the causes that may annoy him, shou'd double the life of other Creatures by very many years. He proceeds, What else are *Trees* in comparison with the *Earth*, but as hairs to the body of *Man*? And it is certain, that (without some distemper, or forcible cause) the hairs dure with the body, and are esteem'd excrements but from their superfluous growth: So as he resolves upon good Reason, that *Fruit trees* well ordered, may live a *thousand* years, and bear *Fruit*; and the longer the more, the greater, and the better (for which an Instance also in *Dr. Beale's Herefordshire Orchards*, pag. 21, 22.) because his vigour is proud and stronger, when his years are many. Thus shall you see *old Trees* put forth their

their *Buds* and *Blossoms* both sooner, and more plentifully than *young Trees* by much; And I sensibly perceive (saith he) my *young Trees* to enlarge their *Fruit* as they grow greater, &c. And if *Fruit-Trees* continue to this *Age*, how many *Ages* is it to be supposed strong and huge *Timber-Trees* will last? whose massie *bodies* require the years of divers *Methusela's* before they determine their days; whose *Sap* is strong and bitter; whose *Bark* is hard and thick, and their substance solid and stiff; all which are defences of health and long life. Their strength withstands all forceable *Winds*; their *Sap* of that quality is not subject to *Worms* and tainting; their *Bark* receives seldom or never by casualty any wound; and not only so, but he is free from *Removals*, which are the death of millions of *Trees*; whereas the *Fruit-tree* (in comparison) is little, and frequently blown down; his *Sap* sweet, easily and soon tainted; his *Bark* tender, and soon wounded; and himself used by *Man*, as *Man* uses himself; that is, either *unskilfully*, or *carelessly*. Thus he. But *Vossius de Theolog. Gent. l. 5. c. 5.* gives too little age to *Asbes*, when he speaks but of one hundred years; and to the *Medica*, *Pyrus*, *Prunus*, *Cornus* but sixty: he had as good have held his peace: Even *Rosemary* has lasted amongst us a hundred years.

4. I might to this add much more, and truly with sufficient probability, that the *Age* of *Timber-trees*, especially of such as be of a compact, resinous, or balsamical nature (for of this kind are the *Eugh*, *Box*, *Horn-beam*, *White-thorn*, *Oak*, *Walnut*, *Cedar*, *Juniper*, &c.) are capable of very long duration and continuance: Those of largest *Roots* (a sign of *Age*) longer liv'd than the shorter; the dry than the wet; and the gummy, than the watery, sterile, than the fruitful: For not to conclude from *Pliny's Hercynian Oaks*, or the *Terpentine Tree* of *Idumæa*, (which *Josephus* ranks also with the *Creation* :) I mention'd a *Cypress* yet remaining somewhere in *Persia* neer an old *Sepulchre*, whose *stem* is as large as five men can encompass, the boughs extending fifteen paces every way; this must needs be a very old *Tree*, believ'd by my *Author* little less than 2500. years of age: The particulars were too long to recount. The old *Platanus* set by *Agamemnon*, mention'd by *Theophrastus*, and the *Herculean Oaks*; the *Laurel* neer *Hippocren*, the *Vatican Ilex*, the *Vine* which was grown to that bulk and *Woodiness*, as to make *Columns* in *Juno's Temple*: *Pliny* mentions one of six hundred years old in his time; and at *Eguan* the late *Duke* of *Montmorams* house, is a *Table* of a very large dimension made of the same plant. And the old *Lotus Trees*, recorded by *Valerius Maximus*, and the *Quercus Mariana* celebrated by that Prince of *Orators*: *Plinies* huge *Larix*, and what grew in the *Fortunate Islands*, with that enormous *Tree* *Scaliger* reports was growing in the *Troglodytic India*, &c. were famous for their age: *Saint Hierome* affirms he saw the *Sycamor* that *Zaccheus* climb'd up, to behold our *LORD* ride in *Triumph* to *Jerusalem*: And now in the *Aventine Mount* they shew us the *Malus*, *Medica*, planted by the hand of *Saint Dominic*: In *Congo* they speak of *Trees* capable to be excavated in *Vessels* that

would contain two hundred *men* a piece. To which add those superannuated *Tilia's* now at *Basil*, and that of *Auspurg*, under whose prodigious *shade* they so often *feast*, and celebrate their *Weddings*; because they are all of them noted for their reverend *Antiquity*; for to such *Trees* it seems they paid *Divine* honours, as the nearest *Emblems* of *Eternity*, & *tanquam sacros ex vetustate*, as *Quintilian* speaks: And like to these might that *Cypresse* be, which is celebrated by *Virgil*, neer to another Monument.

5. But we will spare our *Reader*, and refer him that has a desire to multiply *examples* of this kind, to those undoubted *Records* our *Naturalist* mentions in his 44. *Chap. Lib. 16.* where he shall read of *Scipio Africanus's* Olive-Trees; *Dianus Lotus*, the *Ruminal* Fig-tree lasting (as *Tacitus* calculated 840 years: The *Ilix* of prodigious antiquity, as the *Hetruscan* Inscription remaining on it imported; But *Pausanias* in his *Arcadics*, thinks the *Samian Vitex* (of which already) to be one of the oldest *Trees* growing, and the *Platan* set by *Menelaus*; to these he adds the *Delian Palme*, co evous with *Apollo* himself; and the *Olive* planted by *Minerva* according to their tradition; the over-grown *Myrtil*; the *Vatican Holm*, those of *Tyburnine*, and especially, that neer to *Tusculum*, whose body was thirty five foot about; besides divers others which he there enumerates in a large *Chapter*: And what shall we conjecture of the age of *Xerxes's* huge *Platanus*, in admiration whereof he staid the march of so many hundred thousand men for so many days; by which the wise *Socrates* was us'd to swear? And certainly, a goodly *Tree* was a powerful attractive, when that prudent *Consul*, *Passienus Crispus* fell in love with a prodigious *Beech* of a wonderful age and stature, and that wise Prince *Francis the First*, with an huge *Oak*, which he caus'd to be so curiously immur'd at *Bituriges*.

6. We have already made mention of *Tiberius's Larch*, employ'd about the *Naumachiaria*, which being of one hundred and twenty foot in length, bare two foot *diameter* all that space, not counting the top: To this might be added the *Mast* of *Demetrius's Galeasse*, which consisted of one *Cedar*. And that of the *Float* which wafted *Caligulas Obelisks* out of *Egypt*, four fathoms in circumference: We read also of a *Cedar* growing in the *Island* of *Cyprus*, which was 130 foot long, and 18 in *diameter*; of the *Plane* in *Athens*, whose roots extended 36 *Cubits* farther then the boughs, which were yet exceedingly large; and such another was that most famous *Tree* at *Veliternus*, whose arms stretch'd out 80 foot from the stem: But these were *solid*: Now if we will calculate from the *hollow* besides those mention'd by *Pliny*, in the *Hercynian Forest*; the *Germans* (as now the *Indians*) had of old some *Panti* or *Canoes* of excavated *Oak*, which would well contain thirty, some fourty persons: And the *Lician Platanus* recorded by the *Naturalist*, and remaining long after his days, had a room in it of eighty one feet in compass, adorn'd with *Fountains*, stately *Seats* and *Tables* of *stone*; for it seems it was so glorious a *Tree* both in body, and head, that *Licinius Mutianus* (three times *Consul*, and Governour of that *Province*)

vince) us'd to feast his whole Retinue in it, chusing rather to lodge in it, then in his golden-roofed Palace; And of later date, that vast *Cerrus* in which an *Eremit* built his *Cell* and *Chappel*, so celebrated by the noble *Fracaſtorius* in his Poem *Malteide. Cant. 8. Stro. 30.*

7. Compare me then with *these*, that nine-fathom'd-deep Tree spoken of by *Josephus à Costa*; the *Mastick-tree* seen, and measur'd by Sir *Francis Drake*, which was four and thirty yards in circuit; Those of *Nicaragua* and *Gambra*, which 17 persons could hardly embrace. In *India*, (says *Pliny*) *Arbores tantæ proceritatis traduntur, ut sagittis superari nequeant* (and adds, which I think material, and therefore add also) *Hæc facit ubertas soli, temperies calî, & Aquarum abundantia*. Such were those Trees in *Corſica*, and neer *Memphis*, &c. recorded by *Theophrastus*, &c, and for prodigious height, the two and three hundred foot unparallel'd *Palms-royal* describ'd by Captain *Ligon*, growing in our Plantations of the *Barbados*; or those goodly *Masts* of *Fir*, which I have seen, and measur'd, brought from *New-England*: and what *Bembus* relates of those twenty-fathom'd *Antartic-Trees*; or those of which *Cardan* writes, call'd *Ciba*, which rising in their several *Stems* each of twenty foot, in compass, and as far distant each from other, unite in the *bole* at fifteen foot height from the ground, composing three stately *Arches*, and thence ascending in a *shaft* of prodigious bulk and altitude; Such Trees of 37 foot diameter (an incredible thing) *Scaliger* (his Antagonist) speaks of *ad Gambra fluvium*. *Mathiolus* speaks of a Tree growing in the Island of *Cyprus*, which contain'd 130 foot high found *Timber*: And upon *Mount Ætna* in *Sicily* is a place call'd by them, the *Ire Caſtayne* from three *Chestnut-Trees* there standing, where in the cavity of one yet remaining, a considerable *Flock* of *Sheep* is commonly folded: *Kerchers* words are these, as seen by himself, *Et quod forſan μέγδοξον videri poſſit, oſtendit mihi viæ dux, unius Caſtaneæ Corticem tantæ amplitudinis, ut intra eam integer pecorum grex à paſtoribus, tanquam in Caula, commodiſſima noctu includeretur. China Illuſt. p. 185.* And what may we conceive of those Trees in the *Indias*, one of whose *Nuts* hardly one man is able to carry; and which are so vast, as they depend not like other *Fruit*, by a *Stalke* from the boughs, but are produc'd out of the very body and *ſtem* of the Tree, and are sufficient to feed twenty persons at a *meale*.

We read of a certain *Fig* in the *Caribby Islands*, which emits such large buttresses, that great *Planks* for *Tables* and *Flooring* are cleſt out of them, without the least prejudice to the Tree; and that one of these do easily shelter 200 men under them: *Strabo*, I remember, *Geog. l. 15.* talkes of fifty *Horsmen* under a Tree in *India*; his words are *ἑνὶ δένδρῳ μισσημιλλίων σκιάζοντων ἑκατὸς πεντήκοντα*, and of another that shaded five *stadia* at once; and in another place of a *Pine* about *Ida*, which held 24 foot diameter, and of a monstrous height: But *this*, and all we have hitherto produc'd, is nothing to what I find mention'd in the late *Chineze History* (as 'tis set forth upon occasion of the *Dutch Embaſſy*) where they tell us of

a certain Tree call'd *Ciennich* (or the Tree of a thousand years) in the Province of *Suchu* neer the City *Kien*, which is so prodigiously large, as to shrow'd 200 Sheep under one onely branch of it, without being so much as perceiv'd by those who approach it. And to conclude with yet a greater wonder, of another in the Province of *Chekiang*, whose amplitude is so stupendiously vast, as *four* score persons can hardly embrace: not to omit the strange, and incredible bulk of some Oaks standing lately in *Westphalia*, whereof one serv'd both for a Castle and Fort, and another there which contain'd in height 130 foot, and (as some report) 30 foot diameter: I have read of a Table of Walnut-tree to be seen at Saint Nicholas's in *Lorraine*, which held 25 foot broad, all of a piece, and of competent length and thicknesse, rarely *slek'd* and *watered*; *Scamozzi* the *Architect* reports he saw it: Such a monster, that might be, under which the Emperor *Fred.* the third held his magnificent Feast 1472. For in this *resention* we will endeavour to give a taste of more fresh observations, and to compare our modern Timber with the Ancient, and that, not only abroad, but without travelling into forreign Countries for these wonders.

8. What goodly Trees were of old ador'd, and consecrated by the *Dryads* I leave to conjecture from the stories of our ancient Britains, who had they left Records of their prodigies in this kind, would doubtlesse have furnish'd us with examples as remarkable for the growth and stature of Trees, as any which we have deduc'd from the Writers of forreign places, since the remains of what are yet in being (notwithstanding the havock which has universally been made, and the little care to improve our woods) may stand in fair competition with any thing that Antiquity can produce.

9. There is somewhere in *Wales* an *Inscription* extant, cut into the wood of an old Beam, thus,

SEXAGINTA PEDES FUERANT IN STIPITE NOSTRO,
EXCEPTA COMA QUÆ SPECIOSA FUIT.

This must needs have been a noble Tree, but not without later parallels; for to instance in the several species, and speak first of the bulks of some immense Trees; there was standing an old and decay'd Chestnut at *Fraiting* in *Essex*, whose very stump did yield thirty sizable load of Logs; I could produce you another of the same kind in *Glostershire* which contains within the bowels of it a pretty wain-scotted Room inlighten'd with windows, and furnish'd with seats, &c. to answer the *Lician Platanus* lately mention'd.

10. But whilest I am on this period; see what a *Tilia* that most learn'd, and obliging person, *D. Brown* of *Norwich*, describes to me in a Letter just now receiv'd.

An extraordinary large, and stately *Tilia*, Linden or Lime-tree, there groweth at *Depeham* in *Norfolk*, ten miles from *Norwich*, whose measure is this, The compass in the least part of the Trunk or body
about

about two yards from the ground is at least eight yards and half: about the root nigh the earth, sixteen yards, about half a yard above that, neer twelve yards in circuit: The height to the uppermost boughs about thirty yards, which surmounts the famous *Tilia* of Zurich in Switzerland; and uncertain it is whether in any *Tilicetum*, or Lime-walk abroad it be considerably exceeded: Yet was the first motive I had to view it not so much the largeness of the Tree, as the general opinion that no man could ever name it; but I found it to be a *Tilia fæmina*; and (if the distinction of Bauhinus be admitted from the greater, and lesser leaf) a *Tilia Platyphyllos* or *Latifolia*; some leaves being three inches broad; but to distinguish it from others in the Country, I call'd it *Tilia Colossæa Depehamensis*. Thus the Doctor.

A Poplar-tree not much inferior to this he informs me grew lately at Harlingly Thetford, at Sir William Gawdies gate, blown down by that terrible Hurrocan about four years since.

11. I am told of a very *Withy* tree to be seen somewhere in *Barkshire*, which is increased to a most stupendious bulk: But these for arriving hastily to their *Acme*, and *period*, and generally not so considerable for their use; I pass to the *Ash*, *Elm*, *Oak*, &c.

There were of the first of these divers which meatur'd in length one hundred and thirty two foot, sold lately in *Essex*: and in the Manor of *Horton* (to go no farther than the Parish of *Ebham* in *Surrey*, belonging to my Brother *Richard Evelyn Esq*;) there are *Elms* now standing in good numbers, which will bear almost three foot square for more then forty foot in height, which is (in my judgement) a very extraordinary matter. They grow in a moist Gravel, and in the Hedge-rows.

Nor to insist upon *Beech*, which are frequently very large; there are *Oaks* of forty foot high; and five foot diameter yet flourishing in divers old Parks of our Nobility and Gentry.

A large and goodly *Oak* there is at *Reedham* in Sir *Richard Bernays* Park of *Norfolk*, which I am inform'd was valu'd at forty pounds the Timber, and twelve pounds the lopping wood.

12. Nor are we to over-pass those memorable Trees which so lately flourished in *Dennington Park* neer *Newberry*; amongst which, three were most remarkable from the ingenious Planter, and dedication (if Tradition hold) of the famous English Bard, *Jeofry Chaucer*; of which one was call'd the *Kings*, another the *Queens*, and a third *Chaucers Oak*. The first of these was fifty foot in height before any bough or knot appear'd, and cut five foot square at the butt-end, all clear Timber. The *Queens* was fell'd since the Wars, and held forty foot excellent Timber, straight as an arrow in growth and grain, and cutting four foot at the stub, and neer a yard at the top; besides a fork of almost ten foot clear timber above the shaft, which was crown'd with a shady tuft of boughs, amongst which, some were on each side curved like *Rams-horns*, as if they had been so industriously bent by hand. This *Oak* was of a kind so excellent, cutting a grain clear as any *Clap-board* (as appear'd in the *Wainscot* which was made thereof) that a thousand pities it is some *semina-*

ry of the *Acorns* had not been propagated, to preserve the species. *Chaucers Oak*, though it were not of these dimensions, yet was it a very goodly Tree: And this account I receiv'd from my most honour'd friend *Phil. Packer Esq*; whose *Father* (as now the *Gentleman* his *Brother*) was proprietor of this *Park*: But that which I would farther remark, upon this occasion is, the *bulk*, and *stature* to which an *Oak* may possibly arrive within lesse then three *hundred* years; since it is not so long that our *Poet* flourish'd (being in the *Reign* of *King Edward the fourth*) if at least he were indeed the *Planter* of those *Trees*, as 'tis confidently affirm'd. I will not labour much in this enquiry; because an *implicit* faith is here of great encouragement; and it is not to be conceiv'd what *Trees* of a good kind, and in apt *soil*, will perform in a few years; and this (I am inform'd) is a sort of *gravelly clay*, moistn'd with small and frequent springs. In the mean while, I have often wish'd, that *Gentlemen* were more curious of transmitting to *Posterity*, such *Records*, by noting the *years* when they begin any considerable *Plantation*; that the *Ages* to come, may have both the satisfaction, and encouragement by more accurate and certain *Calculations*. I find a *Jewish* tradition, cited by the learned *Bochart*, That *Noah* planted the *Trees* (he supposes *Cedars*) of which he afterwards built the *Ark* that preserv'd him. But to proceed.

13. There was in *Cuns-burrow* (sometimes belonging to my Lord of *Dover*) several *Trees* bought by a *Couper*, of which he made *ten pound per yard* for three or four yards, as I have been credibly assur'd: But where shall we parallel that mighty *Tree* which furnish'd the *Main-mast* to the *Sovereign* of our *Seas*, which being one *hundred foot* long and one, bare *thirty five inches diameter*. Yet was this exceeded in proportion, and use, by that *Oak* which afforded those prodigious *beams* that lye thwart her. The *diameter* of this *Tree* was four foot nine *inches*, which yielded four-square beams of *four and forty foot* long each of them. The *Oak* grew about *Framingham* in *Suffolk*; and indeed it would be thought fabulous, but to recount only the extraordinary dimensions of some *Timber-trees* growing in that *County*; and of the excessive sizes of these *materials*, had not mine own hands measur'd a *Table* (more then once) of above *five foot* in breadth, *nine* and an *half* in length, and *six inches* thick, all intire and clear: This plank cut out of a *Tree* fell'd down by my *Fathers* order, was made a *Pastry board*, and lyes now on a frame of solid *Brick work* at *Wotton* in *Surrey*, where it was so placed before the *room* was finish'd about it, or wall built, and yet abated by *one foot* shorter, to confine it to the intended dimensions of the place; for at first, it held this breadth, full *ten foot* and an *half* in length. *Mersennus* tells us that the *Great Ship* call'd the *Crown*, which the late *French King* caus'd to be built, has its *keel-timber* *120 foot* long; and the *Main-mast* *12 foot diameter* at the bottom, and *85* in height.

14. To these I might add that superannuated *Engl tree* growing now in *Braburne Church-yard*, not far from *Scots hall* in *Kent*, vvhich being

being 58 foot 11 inches in the *circumference*, will bear neer twenty foot *diameter*, as it was measur'd first by my self imperfectly, and then more exactly for me, by order of the Right Honourable Sir George Carteret, Vice-Chamberlain to his Majesty, and late Treasurer of the Navy: not to mention the goodly planks, and other considerable pieces of squar'd, and clear *Timber*, which I observ'd to lye about it, that had been hew'd, and sawn out of some of the *Arms* only, torn from it by impetuous winds. Such another *Monster* I am inform'd is also to be seen in *Sutton Church yard*, neer *Winchester*: But these (with infinite others, which I am ready to produce) might fairly suffice to vindicate, and assert our *Proposition*, as it relates to *modern examples*, and sizes of *Timber-trees*, comparable to any of the *Ancients*, remaining upon laudable and unsuspected *Record*; were it not great ingratitude to conceal a most industrious, and no less accurate *Account*, which comes just now to my hands from Mr. Halton, Auditor to the Right Honourable, the most Illustrious, and Noble, Henry Lord Howard of Norfolk.

In Sheffield Lordship.

15. In the *Hall Park*, neer unto *Rivelin*, stood an Oak which had eighteen yards without bough, or knot; and carryed a yard and six inches square at the said height, or length, and not much bigger neer the root: Sold twelve years ago for 11 li. Consider the distance of the place, and Country, and what so prodigious a Tree would have been worth neer London.

The names of the persons who gave intelligence of the particulars.
Edw. Rawson.

In *Firth's Farme* within *Sheffield Lordship*, about twenty years since, a Tree blown down by the wind, made, or would have made two *Forge-hammer-beams*, and in those, and the other wood of that Tree, there was of worth, or made 50 li. and *Godfrey Frogat* (who is now living) did oft say, he lost 30 li. by the not buying of it.

Cap. Bullock;

A *Hammer-beam* is not less then 7½ yards long, and 4 foot square at the barrel.

In *Sheffield Park*, below the *Manor*, a Tree was standing which was sold by one *Giffard* (servant to the then Countess of Kent) for 2 li. 10 s. to one *Nich. Hicks*; which yielded of sawn *Wair* fourteen hundred, and by estimation, twenty *Chords* of wood.

A *Wair* is two yards long, and one foot broad, sixscore to the hundred: so that; in the said Tree was 10080 foot of *Boards*; which, if any of the said *Boards* were more then half-inch thick, renders the thing yet more admirable.

Ed. Morphy, Wood-ward.

In the upper end of *Rivelin* stood a Tree, call'd the *Lords-Oak*, of twelve yards about, and the top yielded twenty one *Chord*, cut down about thirteen years since.

In *Sheffield Park*, An. 1646. stood above 100 Trees worth 1000 li. and there are yet two worth above 20 l. still note the place, and market.

In the same *Park*, about eight years ago, *Ralph Archdall* cut a Tree

Tree that was thirteen foot *diameter* at the *Kerf*, or cutting place neer the Root.

In the same Park two years since, Mr. *Sittwell*, with *Jo. Magson* did chuse a *Tree*, which after it was cut, and laid aside flat upon a level ground, *Sam. Staniforth* a *Keeper*, and *Ed. Morphy*, both on horse-back, could not see over the *Tree* one anothers *Hat-crowns*. This *Tree* was afterwards sold for 20 *li*.

In the same Park, neer the old foord, is an *Oak-tree* yet standing, of ten yards *circumference*.

Jo. Halton.

In the same Park, below the *Conduit* Plain, is an *Oak-tree* which bears a *top*, whose *boughs* shoot from the *boal* some fifteen, and some sixteen yards.

Then admitting 15½ yards for the common, or mean extent of the *boughs* from the *boal*, which being doubled is 31 yards; and if it be imagin'd for a *diameter*, because the *Ratio* of the *diameter* to the *circumference* is $\frac{7}{22}$ it follows 113. 355 :: 31. 97 $\frac{44}{113}$ yards which is the *circumference* belonging to this *diameter*.

Then farther it is demonstrable in *Geometry*, that half the *diameter* multiplied into half the *circumference* produces the *Area* or quantity of the *Circle*, and that will be found to be 754 $\frac{347}{432}$ which is 755 square yards *ferè*.

Then lastly, if a *Horse* can be limited to three square yards of ground to stand on (which may seem a competent proportion of three yards long, and one yard broad) then may 251 *Horse* be well laid to stand under the shade of this *Tree*. But of the more *Northern Cattle* certainly, above twice that number.

Workfopp-Park.

*Kenhelm
Homer.*

16. In this Park, at the corner of the *Bradshaw*-rail, lyeth the *boal* of an *Oak-tree* which is twenty nine foot about, and would be found thirty, if it could be justly measur'd; because it lyeth upon the ground; and the length of this *boal* is ten foot, and no arm, nor branch upon it.

*Jo. Magson.
Geo. Hall.*

In the same Park, at the white gate, a *Tree* did stand that was from bough end to bough end (that is, from the extream ends of two opposite boughs) 180 foot; which is witness'd by *Jo. Magson* and *Geo. Hall*, and measur'd by them both.

Then because 180 foot, or 60 yards is the *diameter*; 30 yards will be the *semidiameter*: And by the former Analogies

$$113. 355 :: 60. 188\frac{1}{2}$$

and

$$1. 30 :: 94\frac{1}{2}. 2827\frac{1}{2}$$

That is, the *Content* of ground upon which this *Tree* perpendicularly drops, is above 2827 square yards, which is above half an *Acre* of ground: And the assigning three

three square yards (as above) for an *Horse*, there may 942 be well said to stand in this compass.

In the same *Park* (after many hundreds sold, and carryed away) there is a *Tree* which did yield *quarter-cliff bottoms* that were a yard square: and there is of them to be seen in *Worksopp* at this day, *Jo. Mignon* and some *Tables* made of the said *quarter-cliff* likewise.

In the same *Park*, in the place there call'd the *Hawks nest*, are *Trees* forty foot long of *Timber*, which will bear two foot square at the top-end or height of forty foot.

If then a *square* whose side is two foot, be inscribed in a *Circle*, the proportions at that *Circle* are

	feet
Diameter	2 : 8284
Circumference	8 : 8858
Area	6 : 2831

And because a *Tun* of *Timber* is said to contain forty solid feet: one of these *Columns* of *Oak* will contain above six *Tun* of *Timber* and a quarter: in this computation taking them to be *Cylinders*, and not tapering like the *segment* of a *Cone*.

Welbeek-Lane.

17. The *Oak* which stands in this *Lane* call'd *Grindal Oak*, hath at these several distances from the ground these *Circumferences*,

	foot	foot	inch
at 1	33	:	01
at 2	28	:	05
at 6	25	:	07

The breadth is from bough-end to bough-end (*i.*) *diametrically* 88 foot; the height from the ground to the top-most bough 81 foot [this *dimension* taken from the proportion that a *Gnomon* bears to the shadow] there are three *Arms* broken off and gone, and eight very large ones yet remaining, which are very fresh and good *Timber*.

88 foot is $29\frac{1}{3}$ yards, which being in this case admitted for the *diameter* of a *circle*, the *square yards* in that *circumference* will be 676 *ferè*; and then allowing three yards (as before) for a beast, leaves 225 beasts, which may possibly stand under this *Tree*.

But the *Lords-Oak*, that stood in *Rivelin*, was in *diameter* three yards, and twenty eight inches; and exceeded this in *circumference* three feet, at one foot from the ground.

Shire-Oak.

Shire-Oak is a *Tree* standing in the ground late Sir *Tho. Hewets*, *Hon. Homes* about a mile from *Worksopp-Park*, which drops into three *Shires*, viz. *York*, *Nottingham*, and *Derby*, and the distance from bough-

Y

end

end to bough-end, is ninety foot, or thirty yards.

This circumference will contain neer 707 square yards, sufficient to shade 235 horse.

Thus far the accurate Mr. Halton.

18. Being inform'd by a person of credit, that an Oak in *Sheffield-Park*, call'd the *Ladies-Oak*, fell'd, contain'd forty two Tun of Timber, which had Arms that held at least four foot square for ten yards in length; the Body six foot of clear Timber: That in the same Park one might have chosen above 1000 Trees worth above 6000 li. another 1000 worth 4000 li. & sic de ceteris: To this M. Halton replies, That it might possibly be meant of the *Lords-Oak* already mention'd to have grown in *Rivelin*: For now *Rivelin* it self is totally destitute of that issue she once might have gloried in of Oaks; there being only the *Hall-Park* adjoining, which keeps up with its number of Oaks. And as to the computation of 1000 Trees formerly in *Sheffield-Park* worth 6000 li. it is believ'd there were a thousand much above that value; since in what is now inclos'd, it is evident touching 100 worth a thousand pounds. I am inform'd that an Oak (I think in *Shropshire*) growing lately in a Coppse of my Lord *Cravens*, yielded 19 Tun and half of Timber, 23 Cord of Fire-wood, 2 load of Brush, and 2 load of Bark. And my worthy friend *Leonard Pinckney Esq;* late first Clerk of his Majesties *Kitchen* (from whom I receiv'd the first hints of many of these particulars) did assure me, that one *John Garland* built a very handsome Barne, containing five Baies, with Pan, Posts, Beams, Spars, &c. of one sole Tree, growing in *Worksope-Park*. I will close This with an Instance which I greatly value, because it is transmitted to me from that honourable and noble Person *Sir Ed. Harley*: I am (says he) assur'd by an Inquisition taken about 300 years since, that a Park of mine, and some adjacent Woods, had not then a Tree capable to bear Acorns; Yet, that very Park I have seen full of great Oaks, and most of them in the extreamest Wane of decay. The Trunk of one of these Oaks afforded so much Timber, as upon the place would have yielded 15 li. and did compleatly seat with *Waine-scot* Pies a whole Church: You may please (says he, writing to *Sir Rob. Morray*) to remember when you were here, you took notice of a large Tree, newly fallen; When it was wrought up, it proved very hollow and unsound: One of its cavities contain'd two Hogs-heads of Water, Another was filled with better stuff, Wax and Hony; Notwithstanding all defects, it yielded, besides three Tun of Timber, 23 Cords of Wood: But my own Trees are but Chips in comparison of a Tree in the Neighbourhood, in which every foot forward one with another, was half a Tun of Timber, It bore 5 foot square, 40 foot long; It contain'd 20 Tun of Timber, most of it sold for 20 s. per Tun; besides that the Boughs afforded 25 Cords of Fuel-wood; This was call'd the *Lady-Oak*: It's not pitty such goodly creatures should be devoted to *Vulcan*? &c. So far this noble Gent. to which I would add *Dire*, a deep Execration of *Iron-Mills*, and I had almost sayd *Iron-Masters* too

Quos ego ; sed motos præstat componere —

for I should never finish to pursue these *Instances* through our once goodly *Magazines* of *Timber* for all uses, growing in this our native *Country*, comparable (as I said) to any we can produce of *elder times*; and that not only (though chiefly) for the encouragement of *Planters*, and *Preservers* of one of the most excellent, and necessary *Materials* in the *World* for the benefit of *Man*; but to evince the continu'd *vigor* of *Nature*, and to reproach the want of *Industry* in this *Age* of ours; and (that we may return to the *Argument* of this large *Chapter*) to assert the *procerity*, and *stature* of *Trees* from their very great *Antiquity*: For certainly, if that be true, which is by divers affirmed concerning the *Quercetum* of *Mambre* (where the *Patriarch* entertain'd his *Angelical* Guests) recorded by *Eusebius* to have continued till the time of *Constantine* the Great, we are not too prejudicately, to censure what has been produc'd for the proofs of their *Antiquity*; nor for my part, do I much question the *Authorities*: But let this suffice; what has been produc'd being only an historical *speculation*, of more encouragement haply then other *use*, but such as was pertinent to the *subject* under consideration, as well as what I am about to add concerning the *Texture*, and *similar* parts of the body of *Trees*, which may also hold in *shrubs*, and other *lignous* plants; because it is both a *curious*, and *Rational* account of their *Anatomization*, and worthy of the sagacious *Inquiry* of that incomparably learned Person, *Dr. Goddard*, as I find it entered amongst other of those precious *Collections* of this *Illustrious Society*.

19. The *Trunk* or bough of a *Tree* being cut *transversely* plain and smooth, sheweth several *Circles* or *Rings* more or less *Orbicular*, according to the external figure, in some *parallel* proportion, one without the other, from the *centre* of the *Wood* to the inside of the *Bark*, dividing the whole into so many *circular* spaces. These *Rings* are more large, gross, and distinct in colour and substance in some kind of *Trees*, generally in such as grow to a great bulk in a short time, as *Fir*, *Ash*, &c, smaller or less distinct in those that either not all, or in a longer time grow great; as *Quince*, *Holly*, *Box*, *Lignum-vitæ*, *Ebony*, and the like sad colour'd and hard *woods*; so that by the largeness, or smallness of the *Rings*, the quickness, or slowness of the growth of any *Tree* may perhaps at certainty be estimated.

These *spaces* are manifestly broader on the one side, then on the other, especially the more outer, to a double proportion, or more; the inner being neer an equality.

It is asserted, that the larger parts of these *Rings* are on the *South* and *sunny* side of the *Tree* (which is very rational and probable) inasmuch, that by cutting a *Tree* *transverse*, and drawing a *diameter* through the broadest and narrowest parts of the *Rings*, a *Meridian* line may be described.

The outer spaces are generally narrower then the inner, not onely in their narrower sides, but also on their broader, compared with the same sides of the inner : Notwithstanding which, they are for the most part, if not altogether, bigger upon the whole account.

Of these spaces, the *outer* extremities in *Fir*, and the like *woods*, that have them larger and grosser, are more dense, hard, and compact ; the inner more soft and spongy ; by which difference of substance it is, that the *Rings* themselves come to be distinguished.

According as the bodies and boughs of *trees*, or several parts of the same, are bigger, or lesser, so is the *number*, as well as the *breadth* of the *circular* spaces greater or lesse ; and the like, according to the *age*, especially the *number*.

It is commonly, and very probably asserted, that a Tree gains a *new* one every year. In the body of a great *Oak* in the *New-Forest*, cut *transversely even* (where many of the Trees are accounted to be some hundreds of years old) three, and four hundred have been distinguish'd. In a *Fir-tree*, which is said to have just so many rows of boughs about it, as it is of years growth, there has been observed just *one* lesse, immediately above one row, then immediately below : Hence some probable account may be given of the difference between the outer, and the inner parts of the *Rings*, that the outermost being newly produced in the *Summer*, the exterior superficies is condens'd in the *Winter*.

20. In the young branches and twigs of *Trees* there is a *pith* in the middle, which in some, as *Ash*, and especially *Elder*, equals, or exceeds in dimensions the rest of the substance, but waxes lesse as they grow bigger, and in the great boughs and trunk scarce is to be found : This gives way for the growth of the inward *Rings*, which at first were lesse than the outer (as may be seen in any *shoot* of the first year) and after grow thicker, being it self *absum'd*, or perhaps converted into *Wood* ; as it is certain *Cartilages* or *Gristles* are into *bones* (in the bodies of *Animals*) from which to sense they differ even as much as pith from *Wood*.

These *Rings* or spaces appearing upon transverse *Section* (as they appear *elliptical* upon *oblique*, and strait lines upon *direct Section*) are no other than the extremities of so many *Integuments*, investing the whole *Tree*, and (perhaps) all the boughs that are of the same age with any of them, or older.

The growth of *Trees Augmentation* in all dimensions is acquired, not onely by *accession* of a new *Integument* yearly, but also by the *Reception* of nourishment into the *Pores*, and substance of the rest, upon which they also become thicker ; not only those towards the middle, but also the rest, in a thriving *Tree* : Yet the principal growth is between the *bark* and *body*, by *accession* of a new *Integument* yearly, as hath been mentioned : Whence the cutting of the *bark* of any tree or bough round about, will certainly kill it.

The *bark* of a *Tree* is distinguished into *Rings*, or *Integuments* no lesse than the *Wood*, though much smaller or thinner, and therefore

fore not distinguishable, except in the thick *bark* of great old *Trees*, and toward the *inside* next the *wood*; the outer parts drying and breaking with innumerable *fissures*, growing wider and deeper, as the body of the *Tree* grows bigger, and mouldering away on the out side.

Though it cannot appear by reason of the continual decay of it upon the account aforesaid; yet it is probable, the *bark* of a *Tree* hath had successively as many *Integuments* as the *wood*; and that it doth grow by acquisition of a *new one* yearly on the inside, as the *wood* doth on the out-side; so that the chief way, and conveyance of nourishment to both the *wood* and the *bark*, is between them both.

The least *bud* appearing on the body of a *Tree*, doth as it were make *perforation* through the several *Integuments* to the middle, or very neer; which part is as it were, a *Root* of the bough into the body of the *Tree*; and after becomes a *knot*, more hard then the other *wood*: And when it is larger, manifestly shewing it self also to consist of several *Integuments*, by the *circles* appearing in it, as in the body: more hard, probably; because streightned in room for growth; as appears by its distending, buckling, as it were, the *Integuments* of the *wood* about it; so implicating them the more; whence a *knotty* piece of *wood* is so much harder to cleave.

It is probable, that a *Cience* or Bud upon *Grafting*, or *Inoculating*, doth, as it were, *Root* it self into the *stock* in the same manner as the *branches*, by producing a kind of knot. Thus far the accurate *Doctor*.

21. To which permit me to add onely (in reference to the *Circles* we have been speaking of) what another curious *Inquirer* suggests to us; *namely*, That they are caus'd by the *Pores* of the *wood*, through which the *Sap* ascends in the same manner as betwixt the *Wood* and the *Bark*; and that in some *Trees*, the *bark* adheres to the *wood*, as the *Integuments* of *Wood* cleave to one another, and may be separated from each other as the *bark* from the outward-most; and being thus parted, will be found on their *out sides* to represent the *Colour* of the outer-most, contiguous to the *bark*; and on the *inner sides*, to hold the *Colour* of the *inner* side of the *bark*, and all to have a deeper, or lighter hue on their *inner-side*, as the *Bark* is on that part more or less tinged; which *tincture* is suppos'd to proceed from the *ascendent Sap*. Moreover, by cutting the *branch*, the ascending *Sap* may be examin'd as well as the *Circles*: It is probable, the more frequent the *Circles*, the larger, and more copiously the *liquor* will ascend into it; the fewer, the sooner descend from it. That a *Branch* of three *Circles* cut off at *Spring*, the *Sap* ascending will be found at *Michaelmasse* ensuing; cut again in the same *branch*, or another of equal bignesse, to have one more than it had at *Spring*; and either at *Spring* or *Fall* to carry a *Circle* of *Pricks* next the *bark*, at other seasons a *circle* of *wood* onely next it. But here the Comparison must be made with distinction; for some *Trees* do probably shoot new *tops* yearly till a certain period, and not after; and some have perhaps their *Circles*

cles in their *branches* decreased from their *Bodies* to the extremitie of the *branch*, in such *Oeconomy* and *Order*; that (for instance) an *Apple-tree* shoot of this year has one *Circle* of *Pricks* or *wood* less, than the *Graft* of two years growth; and that of two years growth, may the next year have one *Circle* more than it had the last year; but this onely till that *Branch* shoot no more *Grafts*, and then 'tis doubtful whether the outmost *twig* obtain any more *Circles*, or remain at a *stay*, onely *nourished*, not *augmented* in the *Circles*. It would also be inquir'd, whether the *Circles* of *Pricks* increase not till *Midsummer* and after, and the *Circles* of *Wood* from thence, to the following *Spring*? But this may suffice, unless I should subjoyn.

22. The *vegetative* motion of *Plants*, with the *diagrams* of the *Jesuite Kercher*, where he discourses of their stupendious *Magnificisms*, &c. could there any thing material be added to what has already been so ingeniously inquir'd into: therefore let us proceed to their *Felling*.

Felling.

23. It should be in this *status*, vigour and perfection of *Trees*, that a *Felling* should be celebrated; since whiles our *Woods* are *growing* it is pity, and indeed too soon; and when they are *decaying*, too late: I do not pretend that a man (who has occasion for *Timber*) is obliged to attend so many ages ere he sell his *Trees*; but I do by this infer, how highly necessary it were, that men should perpetually be *Planting*; that so *posterity* might have *Trees* fit for their service of *competent*, that is, of a *middle* growth and age, which it is impossible they should have, if we thus continue to destroy our *Woods*, without this providential *Planting* in their stead, and *felling* what we do cut down, with great discretion, and regard of the future.

24. Such therefore as we shall perceive to *decay* are first to be pick'd out for the *Ax*; and then those which are in their state, or approaching to it; but the very thriving, and manifestly improving, indulg'd as much as possible. But to explore the goodness and sincerity of a *standing-Tree*, is not the easiest thing in the world; we shall anon have occasion to mention my *L. Bacon's* Experiment to detect the *hollownesse* of *Timber*: But there is doubtlesse none more infallible, than the *boring* it with a middling *Piercer* made *Auger* fashion, and by frequent pulling out, and examining what substance comes along with it, as those who bore the Earth to explore what *Minerals* the place is impregn'd with, and as sound *Cheeses* are tasted: Some again there are who by digging a little about the *Roots* will pronounce shrewdly concerning the *state* of a *Tree*; and if they find him perish'd at the *top* (for *Trees* dye upward as Men do from the *feet*) be sure the cause lies deep, for 'tis ever a mark of great decay in the *Roots*. There is also a swelling *Vein* which discovers it self eminently above the rest of the *stem*, though like the rest, invested with *barks*, and which frequently circles about and embraces the *tree*, like a branch of *Ivy*, which is an infallible indication of *Hollownesse* and hypocrisy within.

25. The

25. The time of the *year* for this destructive *work* is not usually till about the end of *April* (at which season the *bark* does commonly rise freely) though the opinions and practise of men have been very different: *Vitruvius* is for an *Autumnal fall*; others advise *December* and *January*: *Cato* was of opinion *trees* should have first born their *fruit*, or, at least, not till full *ripe*, which agrees with that of the *Architect*: And though *Timber unbarked* be indeed more obnoxious to the *Worm*, and to contract somewhat a darker hue (which is the reason so many have commended the *season* when it will most freely *strip*) yet were this to be rather consider'd for such *trees* as one would leave *round*, and *unsquar'd*; since we find the wild *Oak*, and many other sorts, *fell'd* over late, and when the *sap* begins to grow proud, to be very subject to the *worm*; whereas, being cut about *mid-Winter*, it neither *casts, rifts*, nor *twines*; because the cold of the *Winter* does both dry, and consolidate; whiles in *spring*, and when pregnant, so much of the virtue goes into the *leaves* and *branches*: Happy therefore were it for our *Timber*, some real *Invention* of *Tanning* without so much *Bark* (as the Honourable Mr. *Charles Howard* has most ingeniously offer'd) were become universal, that *Trees* being more early *fell'd*, the *Timber* might be better *season'd* and condition'd for its various *Uses*. But as the custom is, men have now time to *sell* their *Woods*, even from *Mid-winter* to the *spring*; but never any after the *Summer Solstice*.

26. Then for the *Age* of the *Moon*, it has religiously been observ'd; and that *Dianas* presidency in *Sylvia* was not so much celebrated to credit the *fictions* of the *Poets*, as for the Dominion of that moist *Planet*, and her influence over *Timber*: For my part, I am not so much inclin'd to these *Criticisms*, that I should altogether govern a *Felling* at the pleasure of this mutable *Lady*; however there is doubtlesse some regard to be had,

Nor is't in vain *Signs* fall and rise to note.

Nec frustra signorum obitus speculamur, & ortus. 1.5

The *Old Rules* are these:

Fell in the *decrease*, or four dayes after *conjunction* of the two great *Luminaries*; some the last quarter of it; or (as *Pliny*) in the very article of the *change*, if possible; which hapning (saith he) in the last day of the *Winter Solstice*, that *Timber* will prove *immortal*: At least should it be from the *twentieth* to the *thirtieth* day, according to *Columella*: *Cato* four dayes after the *Full*, as far better for the growth: But all *viminious Trees* *silente Luna*; such as *Sallies*, *Birch*, *Poplar*, &c. *Vegetius* for *Ship timber*, from the *fifteenth* to the *twenty-fifth*, the *Moon* as before; but never during the *Increase*, *Trees* being then most abounding with moisture, which is the onely source of putrefaction: And yet 'tis affirm'd upon unquestionable *Experience*, that *Timber* cut at any *season* of the *year*, in the *Old Moon*, or last *Quarter*, when the *Wind* blows *Westerly*; proves as *sound*, and good as at any other *period* whatsoever; nay,
all

all the whole *Summer* long, as in any *Month* of the *Year*; which for that it may be of great *use* on some publike *emergencies*, I thought fit to communicate.

27. Then for the *temper*, and time of *day*: The *Wind* low, neither *East* nor *West* (but *West* of the two) the *East* being most pernicious, and exposing it to the *worms*; and for which the best cure is, the plentiful sobbing it in *water*; neither in *frosty*, *wet*, or *dewy* weather; and therefore never in a *Fore-noon*. Lastly, touching the *species*; *Fell Fir* when it begins to *spring*; not only because it will then best quit its *coat* and *strip*; but for that they hold it will never decay in *water*; which howsoever *Theophrastus* deduce from the old *Bridge* made of this material over a certain *River* in *Arcadia*, cut in this *season*, is hardly sufficient to satisfy our inquiry.

28. Previous to this work of *Felling* is the advice of our Countryman *Markham*, and it is not to be rejected: Survey (*saieth he*) your *Woods* as they stand, immediately after *Christmas*, and then divide the *species* in your mind; (I add rather in some *Note-Book*, or *Tablets*) and consider for what *purposes* every several *kind* is most *useful*, which you may find in the several *Chapters* of this *Discourse* under every *Head*. After this, reckon the *bad* and *good* together, so as one may put off the other, without being forc'd to glean your *Woods* of all your best *Timber*. This done (or before) you shall acquaint your self with the *marketable prices* of the *Country* where your *Fell* is made, and that of the several *sorts*; as what so many *inches* or *foot square* and *long* is worth for the several *employments*: What *Planks*, what other *scantlings*, for so many *Speaks*, *Naves*, *Rings*, *Pales*, *Spars*, &c. as suppose it were *Ash*, to set apart the *largest* for the *Wheel-wright*, the *smallest* for the *Cooper*, and that of ordinary *scantling* for the *Ploughs*, and the *brush* to be *kidded*, and sold by the hundred, or thousand, and so all other *sorts* of *Timber*, viz. *large*, *middling stuff*, and *Poles*, &c. allowing the *waste* for the charges of *Felling*, &c. all which you shall *compute* with greater certainty, if you have leisure, and will take the pains to examine some of the *trees* either by your own *Fathom*; or (more accurately) by *girting* it about with a *string*, and so reducing it to the *square*, &c. by which means you may give a neer guess: or, you may mark such as you intend to *Fell*; and then begin your *sale* about *Candlemas* till the *Spring*; before which you must not (according as our *Custom* is) lay the *Ax* to the *Root*; though some for particular *employments*, as for *Timber* to make *Plows*, *Carts*, *Axel-trees*, *Naves*, *Harrows*, and the like *Husbandry-tools*, do frequently cut in *October*.

Being now entering with your *Workmen*, one of the first, and most principal things, is, the skilful *disbranching* of the *Boal* of all such *Arms* and *Limbs* as may endanger it in the *Fall*, wherein much *forecast* and skill is requir'd of the *Wood-man*; so many excellent *trees* being utterly spoiled for want of this onely consideration: And therefore in arms of *Timber*, which are very great, chop a *nick* under it close to the *Boal*, so meeting it with the downnight strokes, it will be sever'd without *splicing*.

29. Some

set it so as it may best dry; then cleanse the *Boal* of the *branches* which were left, and *saw* it into lengths for the *squaring*, to which belongs the *Measure*, and *Girth* (as our *Workmen* call it) which I refer to the *Buyer*, and to many subsidiary *Books* lately *Printed*, wherein it is taught by a very familiar *Calcule Mechanical* and easie Method.

33. But by none in my apprehension set forth, in a more facile and accurate way than what that Industrious *Mathematician* Mr. *Leybourn* has Publish'd, in his late *Line of Proportion made Easie*, and other his *Labours*; where he treats as well of the *Square* as the *Round*, as 'tis applicable to *Boards* and *Superficials*, and to *Timber* which is *hew'd* or lesse rough, in so *Easie a Method*, as nothing can be more desired. I know our ordinary *Carpenters*, &c. have generally upon their *Rulers* a *Line*, which they usually call *Gunters-Line*; but they few of them, understand how to Work from it: And divers *Countrey Gentlemen*, *Stewards*, and *Wood-men*, when they are to *Measure* Rough *Timber* upon the *Ground*, confide much to the *Girt*, which they do with a *string* at about four, or five foot distance from the *Root* or *Great Extream*: Of the *Strings* length, they take a *quarter* for the true *Square*, which is so manifestly erroneous, that thereby they make every *tree* so measur'd, more than a *fift* part lesse than really it is. This *mistake* would therefore be reformed; and it were (I conceive) worth the *Seller's* while to inspect it accordingly: Their *Argument* is, That when the *Bark* of a *Tree* is stripp'd, and the *Body* hew'd to a *Square*, it will then hold out no more measure; that which is cut off being onely fit for *Fuel*, and the Expense of *Squaring* costs more than the *Chips* are worth. But let us however *Convince* them of this *Error* by confronting Mr. *Leybourns Tables*.

PROB. I.

A *Tree* being 68 *Inches* about, to find how much thereof in Length will make one foot *Square*.

SOL.

A fourth part of 60 *Inches*, is 15, which they take for the due *Square*; wherefore look for 15 *Inches* (*viz.* one foot three *Inches*) in the first *Column* of the first *Table*, and opposite to it in the second *Column*, you shall find 7 *Inches*, 6 tenth parts of an *Inch* (which is somewhat above half an *Inch*) will make one foot *Square*. Again,

PROB. II.

A *Tree* being 136 *Inches* about, and 9 *Foot* in length, to know how many *solid Feet* the *Tree* contains?

SOL.

S O L.

The fourth part of 136 is 34 inches in the first *Column* of the second *Table*, and 9 foot in the head of it; and opposite to the 34 inches, and under 9 foot, you shall find 72. 25. (*viz.* 72 foot $\frac{1}{4}$) and for so much you may sell it, and no more, which is yet less than the true content by above a fifth part.

But supposing (as they ought to do) there were no such *Waste* as is pretended; you will find by the third *Table*, how much in length of any *Cylindrical Timber*, whose *Girt* is known, will make a foot solid, and consequently, detect the *Error* of the former customary practise.

P R O B. III.

A Tree being 60 Inches circumference, to know how much thereof will make a cubical foot.

S O L.

Find 60 inches in the first *Column*; and opposite to it in the second *Column*, you shall find 0-6-0 which is to say, 6 inches only: The *Consequence* is, that 6 inches in length of a Tree 60 inches circumference, will make a foot solid: Whereas by the other usual procedure, you found there must be 7 inches and above half an inch, to make so much; which is above an inch and half too much in every foot's length, and what that amounts to in many feet 'tis easy to imagine.

So suppose a Tree be but 29 inches in circumference, the same *Table* will in like manner shew, that it requires but 1 foot 2 inches and 3 tenth parts of an inch in length, to make it a foot solid of Timber; and thus of any number as far as you will enlarge your *Table*.

But then imagine that the *sides* of the *square* at the *extremities* of squar'd Timber are unequal, as frequently it happens, by sometimes 5, 6, 10, or more inches difference: Some *Artificers* think they encounter this well enough by adding the two *sides* together, and taking the *moitie* of the side for the true square: But this is as erroneous as the other; especially, if the *sides* differ considerably. *v. g.* Let one side be 30 inches, and the other 138, these added, make 213, the half whereof is 106 $\frac{1}{2}$, which they estimate for the true square; whereas in truth, the right square is 74 inches, and one tenth part; which demonstrates the error to be 32 inches and 4 tenths.

To reforme therefore this egregious mistake, the fourth *Table* may be calculated to what number of inches you desire: Example,

P R O B. I V.

One side of a square of Timber containing 16 inches, and the other 25: to find the side of a square equal unto it.

S O L.

First, find 16 inches in the fourth Table, opposite to it you have this number 120411. Then find out 25 inches, and opposite to that occurs 139794 which added, produces 260205, and the half of it 130102½. Find in the Table this Number (or the neereft you can to it) and you will see it to stand against 20 inches; which is the true square of such an unequal'd-sided piece of Timber.

$$\begin{array}{r}
 16—120411 \\
 25—139794 \\
 \text{sum}—260205 \\
 20—130102\frac{1}{2}
 \end{array}$$

Note, In these Instances 'tis suppos'd the Tree measur'd to carry the same Proportion of square throughout the Piece, which in almost all Trees that are considerably long, does not hold, by reason of its continual tapering, which must needs cause a great difference in the squares at either extream. Our common Workemen do, to adjust this, for the most part, choose the most likely place about the middle of the Tree, and take its square there; But this is also an Error: Therefore in such Trees, measure the square at both ends, and add the sides of the two squares together, and half that length shall be the true square which the Tree does carry throughout. E. g.

Suppose a Tree have that side of the square at the But-end 32 inches, and at the smaller end 22 onely; Those added, will make 55 inches, and the moitie of that 27½, which is the true side of the square, with which, and the length, you may find by the second Table the just content.

And, in case your Tree be longer than the Table provides for (as for example in this second Table it proceeds but to 10 foot) take the half, or so many times 10 foot, as its length contains, and the odd feet, if they happen, by themselves. V. g.

Suppose a Tree being 31 inches square, is 47 foot long; have recourse to 10 foot in the second Table, and opposite to 31 in the inch Column, you'll find 64 foot, 60 parts under the Column 10: put this down as many times as any tens occur in your 47 foot (which was the length of that Tree, and by the same Table the odd 7 will give you 45 feet 22 parts, which sum'd together, amount to 303 feet, 62 parts, viz. half a foot and half a quarter of a foot. By this Method proceed for any length whatsoever.

There remains but one operation more, which our Timber man can much stand in need of direction in; and that is, for the Measure of Planks; because we have occasion sometimes to saw them in the Wood: We will therefore add one Table more of that, and so dismiss him.

P R O B.

PROB. V.

A Plank or Board being 9 inches broad : to find how much in length will make one foot.

S O L.

First find out 9 inches in the first Column; opposite to that, in the second Column, you shall meet 1. 4. 0. which imports 1 foot, 4 inches : so much then in length of a Plank or Board 9 inches broad, must go to make a foot : So as every 16 inches in length, is a foot of Plank, and consequently, every 8 inches, half a foot; every 4 inches a quarter, &c. Thus again, if a Board hold 2 foot and 3 inches in breadth; 5 inches and 3 tenth parts of an inch in length will make a square superficial foot of Plank, &c sic de ceteris.

TABLE I.

	The Square of the End of Timber in Feet and Inches.				The length of a Foot solid in Feet, Inches and parts of Inches.
	F.	In.	F.	In.	
0.		64	0.	0.	0
		72		11	2
		82		3	0
		91		9	3
		101		3	3
		111		2	3
I.	0	1	0	0	0
	1	0		10	2
	2	0		8	8
	3	0		7	6
	4	0		6	7
	5	0		5	9
	6	0		5	3
	7	0		4	6
	8	0		4	3
	9	0		3	9
	10	0		3	5
	11	0		3	3
II.	0	0		3	0
	1	0		2	8
	2	0		2	6
	3	0		2	3
	4	0		2	1
	5	0		2	1
	6	0		1	9
	7	0		1	8
	8	0		1	7
	9	0		1	6
	10	0		1	5
	11	0		1	4
III.	0	0		1	3

TABLE

TABLE II.

		The length of the Timber.									
Inch.		1		2		3		4		5	
		F.	Pr.	F.	Pr.	F.	Pr.	F.	Pr.	F.	Pr.
-		0	00	0	00	0	00	0	01	0	01
1		0	01	0	01	0	02	0	03	0	03
-		0	01	0	03	0	05	0	06	0	08
2		0	03	0	05	0	08	0	11	0	14
-		0	04	0	08	0	13	0	17	0	21
3		0	06	0	12	0	18	0	25	0	31
-		0	08	0	17	0	25	0	34	0	42
4		0	11	0	22	0	33	0	44	0	55
-		0	14	0	28	0	42	0	56	0	70
5		0	17	0	35	0	52	0	69	0	81
-		0	21	0	42	0	63	0	84	1	05
6		0	25	0	50	0	75	1	00	1	25
-		0	29	0	58	0	88	1	17	1	46
7		0	34	0	68	1	02	1	36	1	70
-		0	39	0	78	1	17	1	56	1	95
8		0	44	0	89	1	33	1	77	2	22
-		0	50	1	90	1	50	1	01	2	51
9		0	56	1	12	1	68	2	25	2	81
-		1	63	1	25	1	88	2	51	3	13
10		1	69	1	39	2	08	2	47	3	47
-		1	76	1	53	2	29	3	06	3	82
11		1	84	1	68	2	52	3	36	4	20
-		1	92	1	84	2	76	3	67	4	59
12		1	00	2	90	3	00	4	00	5	00
-		1	08	2	17	3	25	4	34	5	42
13		1	17	2	35	3	51	4	69	5	87
-		1	26	2	53	3	80	5	06	6	33
14		1	36	2	72	4	08	5	44	6	80
-		1	46	2	92	4	38	5	80	7	30
15		1	55	3	12	4	68	6	25	7	81
-		1	67	3	33	5	00	6	67	8	34
16		1	78	3	55	5	33	7	11	8	89
-		1	89	3	78	5	67	7	56	9	45
17		2	01	4	01	6	02	8	03	10	03
-		2	13	4	25	6	38	8	51	10	63
18		2	25	4	50	6	25	9	00	11	25

Square of Timber in Inches, and half Inches.

TABLE III.

Cir. F. In. Pt.				Cir. F. In. Pt.				Cir. F. In. Pt.			
10	18	11	2	51	0	8	3	92	0	2	6
11	14	11	5	52	0	8	0	93	0	2	5
12	12	6	8	53	0	7	8	94	0	2	5
13	10	8	5	54	0	7	4	95	0	2	4
14	9	2	7	55	0	7	2	96	0	2	4
15	7	10	3	56	0	6	9	97	0	2	3
16	7	0	8	57	0	6	7	98	0	2	3
17	6	3	0	58	0	6	4	99	0	2	2
18	5	7	0	59	0	6	2	100	0	2	2
19	5	0	2	60	0	6	0				
20	4	6	3	61	0	5	8				
21	4	1	2	62	0	5	6				
22	3	8	9	63	0	5	5				
23	3	4	9	64	0	5	2				
24	3	1	7	65	0	5	1				
25	2	10	7	66	0	4	9				
26	2	8	1	67	0	4	8				
27	2	5	8	68	0	4	7				
28	2	3	7	69	0	4	6				
29	2	1	8	70	0	4	4				
30	2	0	1	71	0	4	3				
31	1	10	6	72	0	4	2				
32	1	9	2	73	0	4	1				
33	1	7	9	74	0	3	9				
34	1	6	8	75	0	3	8				
35	1	5	7	76	0	3	7				
36	1	4	7	77	0	3	7				
37	1	3	8	78	0	3	6				
38	1	3	0	79	0	3	5				
39	1	2	3	80	0	3	4				
40	1	1	6	81	0	3	3				
41	1	0	9	82	0	3	2				
42	1	0	3	83	0	3	2				
43	0	11	7	84	0	3	1				
44	0	11	1	85	0	3	0				
45	0	10	7	86	0	2	9				
46	0	10	2	87	0	2	9				
47	0	9	9	88	0	2	8				
48	0	9	4	89	0	2	7				
49	0	9	0	90	0	2	7				
50	0	8	7	91	0	2	6				

The Circumference of the Tree in Inches.

The Circumference of the Tree in Inches.

The Circumference of the Tree in Inches.

TABLE IV.

TABLE IV.

ln.		ln.		ln.		ln.	
1	000000	26	141497	51	170757	70	188081
2	030103	27	143136	52	171600	77	188649
3	047712	28	144715	53	172427	78	189209
4	062206	29	146239	54	173239	79	189762
5	069897	30	147712	55	174036	80	190309
6	077815	31	149136	56	174818	81	190848
7	084509	32	150525	57	175587	82	191381
8	090308	33	151851	58	176342	83	191907
9	095424	34	153147	59	177085	84	192428
10	100000	35	154406	60	177815	85	192941
11	104139	36	155630	61	178532	86	193449
12	107918	37	156820	62	179239	87	193952
13	111394	38	157978	63	179934	88	194448
14	114612	39	159106	64	180618	89	194939
15	117609	40	160205	65	181291	90	195624
16	120411	41	161278	66	181954	91	195904
17	123044	42	162325	67	182607	92	196378
18	125527	43	163346	68	183250	93	196848
19	127875	44	164345	69	183885	94	197312
20	130102	45	165321	70	184509	95	197772
21	132221	46	166275	71	185125	96	198217
22	134242	47	167209	72	185735	97	198677
23	136172	48	168124	73	186332	98	199122
24	138021	49	169019	74	186923	99	129563
25	139794	50	169807	75	187506	100	200060

TABLE V.

TABLE II.

The length of the Timber.						
Inch.	6	7	8	9	10	
	F.	Pt. F.	Pt. F.	Pt. F.	Pt. F.	Pt.
-	0	01 0	01 0	01 0	02 0	03
* 1	0	04 0	05 0	05 0	06 0	07
-	0	09 0	11 0	13 0	11 0	16
* 2	0	17 0	19 0	21 0	23 0	28
-	0	26 0	30 0	34 0	39 0	43
* 3	0	37 0	43 0	49 0	56 0	62
-	0	51 0	59 0	68 0	76 0	85
4	0	66 0	78 0	89 0	99 1	11
-	0	84 0	98 1	121	136 1	40
5	1	04 1	22 1	39 1	56 1	74
-	1	26 1	47 1	68 1	89 2	10
6	1	50 1	55 2	00 2	25 2	50
-	1	76 2	05 2	34 2	64 2	93
7	2	04 2	38 2	72 3	06 3	40
-	2	34 2	73 3	12 3	51 3	90
8	2	66 3	11 3	55 3	99 4	44
-	3	01 3	51 4	01 4	52 5	02
9	3	37 3	91 4	49 5	06 5	62
-	3	76 4	29 5	01 5	64 6	27
10	4	16 4	86 5	35 6	24 6	94
-	4	59 5	35 6	12 6	88 7	65
11	5	04 5	88 6	72 7	56 8	40
-	5	51 6	43 7	35 8	27 9	19
12	6	00 7	00 8	00 9	00 10	00
-	6	51 7	51 8	68 9	76 10	85
13	7	04 8	22 9	39 10	56 11	74
-	7	59 8	86 10	13 11	39 12	66
14	8	16 9	53 10	89 12	25 13	61
-	8	76 10	22 11	68 13	14 14	60
15	9	37 10	93 12	49 14	06 15	62
-	10	01 11	67 13	34 15	01 16	68
16	10	67 12	44 14	23 16	00 17	78
-	11	34 13	24 15	13 17	02 18	91
17	12	05 14	05 16	05 18	06 20	07
-	12	76 14	89 17	01 19	14 21	27
18	13	50 15	75 19	00 20	25 22	50

* Note that the short lines of the Inch-Column, between the Figures 1-2-3 &c. do signifie half-Inches.

Place this between pag. 170, and 171.

* Z

TABLE

TABLE II.

The length of the Timber.									
In.	1	2	3	4	5				
	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.				
-	2 38 4	75 7	13 9	51 11	83				
19	2 51 5	01 7	51 10	03 12	53				
-	2 64 5	28 7	81 10	56 13	20				
20	2 78 5	55 8	33 11	11 13	89				
-	2 91 5	83 8	75 11	67 14	59				
21	3 06 6	12 9	18 12	25 15	31				
-	3 11 6	41 9	63 12	84 16	05				
22	3 36 6	72 10	08 13	44 16	80				
-	3 51 7	03 10	55 14	06 17	58				
23	3 67 7	34 11	01 14	69 18	36				
-	3 83 7	67 11	55 15	34 19	12				
24	4 00 8	00 12	00 16	00 10	00				
-	4 16 8	33 12	50 16	66 10	83				
25	4 34 8	68 13	02 17	36 21	70				
-	4 51 9	02 13	54 18	05 12	56				
26	4 69 9	39 14	08 18	77 13	47				
-	4 88 9	75 14	63 19	51 14	38				
27	5 06 10	12 15	19 20	25 25	31				
-	5 25 10	50 15	75 21	00 26	25				
28	5 44 10	89 16	33 21	78 17	22				
-	5 67 11	34 17	01 22	68 28	35				
29	5 84 11	68 17	52 23	36 29	20				
-	6 04 12	08 18	13 24	17 30	21				
30	6 25 12	50 18	75 25	00 31	25				
-	6 46 12	92 19	36 25	84 32	30				
31	6 67 13	34 20	02 26	69 32	36				
-	6 89 13	78 20	67 27	56 34	45				
32	7 11 14	22 21	33 28	44 35	51				
-	7 33 14	66 21	99 29	33 36	66				
32	7 56 15	12 22	68 30	24 37	81				
-	7 78 15	56 23	34 31	12 38	90				
34	8 03 16	05 24	05 32	11 40	14				
-	8 26 16	52 24	79 33	05 41	31				
35	8 54 17	01 25	51 34	03 42	53				
-	8 70 17	50 26	35 35	00 43	75				
36	9 00 18	00 27	06 36	00 49	00				

Square of the Timber in Inches and half-Inches.

TABLE II.

The length of the Timber.									
In.	6	7	8	9	10				
	F. Pt.	F. Pt.	F. Pt.	F. Pt.	F. Pt.				
-	14 26	16 64	19 01	21 39	23 77				
19	15 04	17 55	20 05	22 56	25 07				
-	15 64	18 49	21 13	23 77	26 41				
20	16 67	19 40	22 22	25 00	27 78				
-	17 51	20 42	23 34	26 26	29 18				
21	18 37	21 43	24 49	27 56	30 62				
-	19 26	22 47	25 68	28 89	32 10				
22	20 16	23 53	26 89	30 25	33 61				
-	21 09	24 61	28 13	31 64	35 16				
23	22 04	25 71	29 38	33 06	36 73				
-	23 01	26 84	30 68	34 51	38 35				
24	24 00	28 00	32 00	36 00	40 00				
-	24 99	29 16	33 33	37 49	41 66				
25	26 04	30 38	34 71	39 06	43 40				
-	27 08	31 59	36 10	40 62	45 13				
26	28 16	32 86	37 55	42 24	46 94				
-	29 26	34 14	39 01	43 89	48 77				
27	30 38	35 44	40 50	45 57	50 63				
-	31 50	36 75	42 00	47 25	52 50				
28	32 67	38 11	43 56	49 00	54 45				
-	34 02	39 69	45 36	51 03	56 70				
29	35 04	40 88	46 72	52 56	58 49				
-	36 26	42 30	48 34	54 39	60 43				
30	37 50	43 75	50 56	56 25	62 50				
-	38 76	45 22	51 68	58 14	64 60				
31	40 04	46 71	53 36	60 06	66 66				
-	41 31	48 23	55 11	62 01	68 68				
32	42 61	49 78	56 89	63 99	71 11				
-	43 99	51 33	58 66	65 99	73 33				
33	45 37	52 93	60 49	68 06	75 62				
-	46 68	54 46	62 24	70 01	78 80				
34	48 17	56 19	64 22	72 15	80 28				
-	49 58	57 84	66 10	74 37	82 63				
35	51 04	59 55	68 05	76 56	85 07				
-	52 50	61 25	70 00	78 75	87 50				
36	54 00	63 00	72 00	81 00	90 00				

Square of the Timber in Inches and half-Inches.

TABLE

TABLE V.

The Breadth of Plauk in Feet and Inches.				
F.	In.	F.	In.	Pts.
0	1	12	0	0
	2	6	0	0
	3	4	0	0
	4	3	0	0
	5	2	4	8
	6	2	0	0
	7	1	8	6
	8	1	6	0
	9	1	4	0
	10	1	2	4
	11	1	1	1
I	0	1	0	0
	1	0	11	8
	2	0	10	3
	3	0	9	6
	4	0	9	0
	5	0	8	5
	6	0	8	0
	7	0	7	6
	8	0	7	2
	9	0	6	8
	10	0	6	5
	11	0	6	2
II	0	0	6	0
	1	0	5	8
	2	0	5	5
	3	0	5	3
	4	0	5	1
	5	0	5	0
	6	0	4	8
	7	0	4	7
	8	0	4	5
	9	0	4	4
	10	0	4	2
	11	0	4	1
III	0	0	4	0

The length of a Foot square, in Feet and 10th. part of Inches.

34. If you are to remove your *Timber*, let the *Dew* be first off, and the *South-wind* blow before you draw it: neither should you by any means put it to use for three, or four months after, unless great necessity urge you, as it did *Duilius*, who in the *Punic War* built his *Fleet* of *Timber* before it was season'd, being not above two months from the very *Felling* to the *Launching*: and as were also those *Navies* of *Hiero* after forty days; and that of *Scipio*, in the third *Carthaginian War*, from the very *Forest* to the *Sea*. *July* is a good time for bringing home your fell'd *Timber*: But concerning the *Time* and *Season* of *Felling*, a just *Treatise* might be written: Let the *Learned* therefore consult *Vitruvius* particularly on this subject, l. 2. c. 19. Also *M. Cato* c. 17. *Plin.* l. 16. c. 31. *Constantinus* and *Heron.* l. 3. de *RR. Veget.* l. 4. c. 35. *Columella* l. 3. c. 2. but especially the most ample *Theophrastus* *ἡρώων ἱστορίαι*, l. 5. Note, that a *Tun* of *Timber* is forty solid Feet, a *Load* fifty.

35. To make excellent *Boards* and *Planks*, 'tis the advice of some, you should *Bark* your *Trees* in a fit season, and so let them stand naked a full year before the *felling*; and in some cases, and grounds, it may be profitable: But let these, with what has been already said in the foregoing *Chapters* of the several *kinds*, suffice for this *Article*: I shall add one *Advertisement* of *Caution* to those *Noble persons*, and others who have *Groves* and *Trees* of ornament neer their *houses*, and in their *Gardens* in *London*, and the *Circle* of it; especially, if they be of great *stature*, and well grown; such as are the *Groves* in the several *Inns of Court*; nay, even that (comparatively, new *Plantation*) in my Lord of *Bedfords* Garden, &c. and wherever they stand in the more interior parts of the *City*; that they be not over hasty, or by any means perswaded to cut down any of their *old Trees*, upon hope of new more flourishing *Plantations*; thickning, or repairing deformities; because they grew so well when first they were set: It is to be consider'd how exceedingly that pernicious *smoak* of the *Sea-coal* is increas'd in, and about *London* since they were first planted, and the buildings environing them, and inclosing it in amongst them, which does so universally contaminate the *Air*, that what *Plantations* of *Trees* shall be now begun in any of those places, will have much ado, great difficulty, and require a long time, to be brought to any tolerable perfection: Therefore let them make much of what they have; and though I discourage none, yet I can animate none to cut down the *old*.

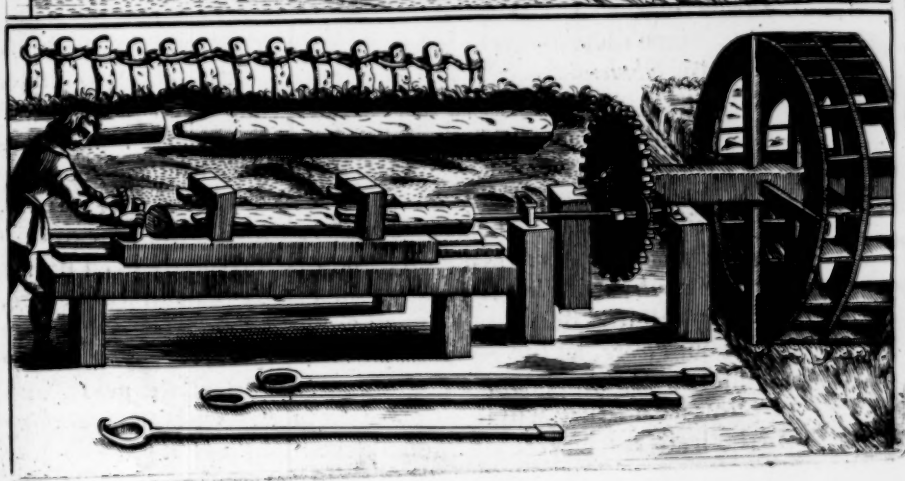
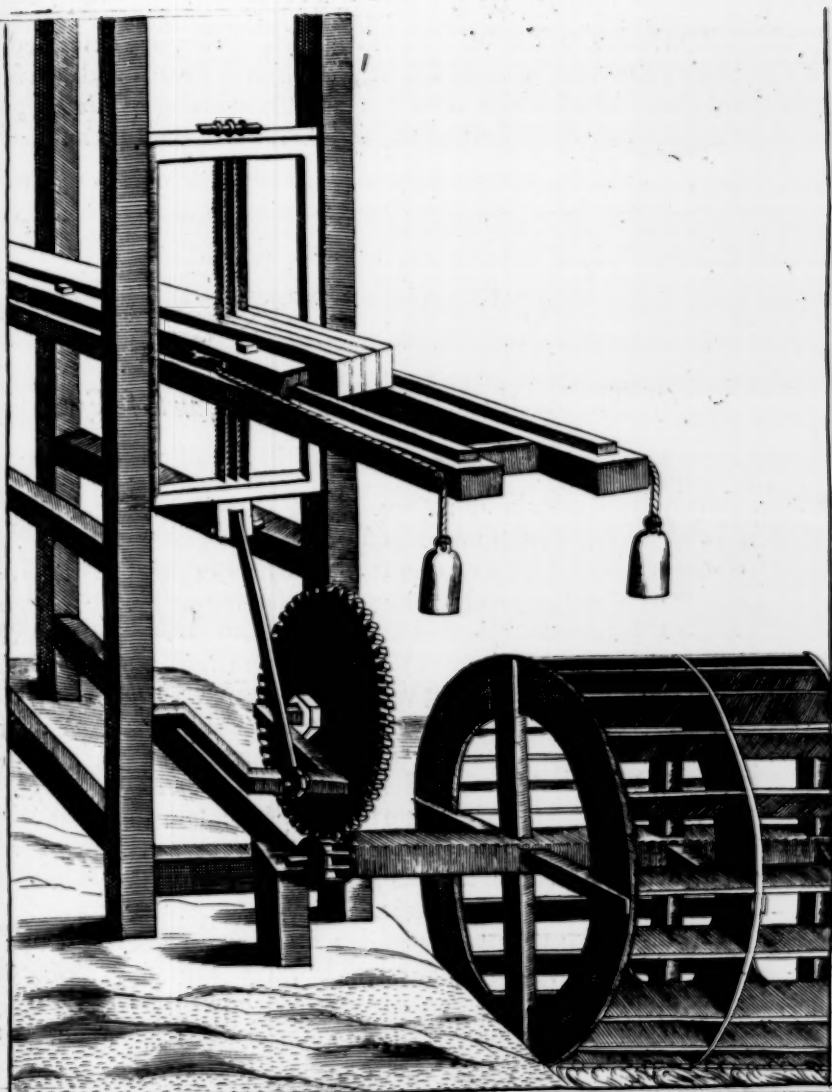
36. And here might now come in a pretty *speculation*, what should be the *Reason* after generall *Fellings* and *Extirpations* of vast *Woods* of one species, the next spontaneous succession should be of quite a different sort? We see indeed something of this in our *Gardens* and *Corn fields* (as the best of *Poets* witnesses) but that may be much imputed to the alteration, by improvement, or detriment of the *Soyle* and other *Accidents*: whatever the *Cause* may be, since it appears not in any universal decay of *Nature* (sufficiently exploded) I shall onely here produce matter of *Fact*, and that it ordinarily

rily happens: As in some goodly Woods formerly belonging to my Grandfather that were all of *Oak*; after felling, they universally sprung up *Beech*; and 'tis affirm'd by general Experience, that after *Beech*, *Birch* succeeds; as in that famous Wood at *Darnway* on the River *Tindarne* in the Province of *Moray* in Scotland, where nothing had grown but *Oak* in a Wood three miles in length, and happily more Southerly, it might have been *Beech*, and not *Birch* 'till the third degradation. *Birches* familiarly grow out of old and decay'd *Oaks*; but whence this *Sympathy* and affection should proceed, is more difficult to resolve, in as much as we do not detect any so prolific, and eminent *Seed* in that Tree. Some *Accidents* of this nature may be imputed to the *Winds*, and the *Birds* who frequently have been known to waste and convey *Seeds* to places widely distant, as we have touch'd in the Chapter of *Firs*, &c. Sect. 4. *Holly* has been seen to grow out of *Ash*, as *Ash* out of severall Trees, especially *Hei-Thorn*; nay, in an old rotten *Ash-stump*, in a place where no *Ashes* at all grew by many miles in the whole County: And I have had it confidently asserted by Persons of undoubted truth, that they have seen a Tree cut in the middle, whose heart was *Ash-wood*, and the exterior part *Oak*, and this in *Northamptonshire*: And why not as well (though with something more difficulty?) as through a *Willow*, whose Body it has been observed to penetrate even to the Earth? obtruding the *Willow* quite out of its place, of which a pretty Emblem might be conceiv'd: But I pursue these Instances no farther, concluding this Chapter with the *Normay Engine*, or *Saw-Mill*, to be either moved with the force of *Water*, or *Wind*, &c. for the more expedite cutting and converting of *Timber*, to which we will add another, for the more facile perforation and boring of *Elms*, or other *Timber* to make *Pipes* and *Aqueducts*, and the excavating of *Columns* to preserve their *Shafts* from splitting, to which otherwise they are obnoxious.

The *Frames* of both these Instruments discover themselves sufficiently to the eye, and therefore will need the less description; There is yet this reformation from those which they use both in *Normay* and *Switzerland*; That whereas they make the *Timber* approach the *Sawes*, by certain indented *Wheels* with a *Rochet* (which is frequently out of order) there is in the first Figure a substitution of two *Counterpoises* of about three hundred pound weight, each, as you may see at A.A. fastning the *Cords* to which they append, at the extrems of two movable pieces of *Timber*, which slide on two other pieces of fixed *Wood*, by the ayd of certain small *Pullys*, which you may imagine to be within an *Hinge* in the *House* or *Mill*, by which means the *Weights* continually draw, and advance the moving pieces of *Wood*, and consequently the *Timber* to be slit, fastned 'twixt the said Pieces, towards the *Teeth* of the *Saws*, rising, and falling as the motion of the *Whee*le directs; And on this *Frame* you may put four or five *Saws*, or more if you please, and place them at what intervals you think fit, according to the dimensions which you designe in cutting the *Timber* for your use; and when the piece

is *sawn*, then one or two men with a *Lever*, must turn a *Roller*, to which there is annex a strong *Cord*, which will draw back the *Piece*, and lift up the *Counter-poise*; and so the *piece* put a little towards one side, direct the *Saws* against another.

The *second Figure* for *Boring*, consists of an *Ax-tree*, to which is fastned a *Wheel* of *six* and *thirty Teeth*, or more, as the velocity of the *Water-motion* requires; for if it be *slow*, more *Teeth* are requisite; There must also be a *Pinion* of *six*, turn'd by the said indented *Wheel*: Then to the *Ax-tree* of the *Pinion* is to be fixt a long *Auger*, as in letter *A*, which must passe through the *hole B*, to be opened and clos'd as occasion requires, somewhat like a *Turners Lathe*: The *Tree* or *piece* of *Timber* to be *Bored*, is to be plac'd on the *Frame C D*, so as the *Frame* may easily slide by the help of certain small *Wheels*, which are in the *hollow* of it, and turn upon strong *Pins*, so as the *Work-man* may shove forwards, or draw the *Tree* back, after 'tis fastned to the *Frame*; that so the *Auger* turning, the end of the *Tree* may be applied to it; still remembring to draw it back at every progresse of three or four *inches* which the *Auger* makes for the clenning it from the *Chips*, least the *Auger* break: Continue this work till the *Tree*, or *piece* of *Timber* be *bored* as far as you think convenient, and when you desire to enlarge the *hole*, change your *Auger Bits* as the *Figure* represents them.



To these we might add severall more, as they are described by *Besson, Ramelli, Cause*, and others; as likewise *Cranes and Machines* for the easier *Elevation, Moving*, and *Transporting* of *Timber*, but they are now become familiar, and therefore I omit them.

CHAP. XXXI.

Of Timber the Seasoning and Uses, and of Fuel.

Seasoning.

Since it is certain and *Demonstrable* that all *Arts* and *Artisans* whatsoever, must *faile* and *cease*, if there were no *Timber* and *Wood* in a *Nation* (for he that shall take his *Pen*, and begin to set down what *Art, Myserie*, or *Trade* belonging any way to *human life*, could be maintain'd and exercis'd without *Wood*, will quickly find that I speak no *Paradox*) I say, when this shall be well *consider'd*, it will appear, that we had better be without *Gold*, than without *Timber*: This contemplation, and the universal *use* of that precious *Material* (which yet is not of universal *use* 'till it be duly prepar'd) has mov'd me to design a solemn *Chapter* for the *seasoning*; as well as to mention some farther particular *Applications* of it. We have before spoken concerning some preparations of *standing Trees* design'd for *Timber*, by a half-cutting, disbarking, and the seasons of *drawing*, and *using* it.

2. Lay up your *Timber* very dry, in an airy place (yet out of the *Wind* or *Sun*) and not standing upright, but lying along one piece upon another, interposing some short *blocks* between them, to preserve them from a certain *mouldiness* which they usually contract while they *sweat*, and which frequently produces a kind of *fungus*, especially if there be any *sappy* parts remaining.

3. Some there are yet, who keep their *Timber* as moist as they can, by *submerging* it in *Water*, where they let it imbibe to hinder the *cleaving*; and this is good in *Fir*, both for the better *stripping* and *seasoning*; yea, and not onely in *Fir*, but other *Timber*: lay therefore your *Boards* a *Fortnight* in the *Water*, and then setting them upright in the *Sun* and *Wind*, so as it may freely passe through them, (especially during the heats of *Summer*, which is the time of finishing *Buildings*) turn them daily; and thus treated, even newly sawn *Boards*, will *Floor* far better than a many years dry *Seasoning*, as they call it. But to prevent all possible *accidents*, when you lay your *Floors*, let the *joynts* be *shot*, fitted, and tack'd down onely for the *first year*, nailing them for good and all the *next*; and by this means they will lye *Stanch*, close, and without *Shrinking* in the least, as if it were all of one piece. Amongst *Whee-le-Wrights* the

the Water-seasoning is of especial regard, and in such esteem amongst some, that I am assur'd the *Venetians* for their Provision in the *Arsenal*, lay their *Oak* some years in it, before they employ it.

Elm fell'd never so green for suddain use, if plung'd four or five dayes in water (especially *Salt*, which is best) obtains an admirable seasoning, and may immediately be us'd. Some again commend buryings in the *Earth*; others in *wheat*; and there be seasonings of the *fire*, as for the scorching and hardning of *Piles* which are to stand either in the *water*, or the *earth*;

— The Oke
Explore, suspended in the Chimney smoke,

Et suspensa focis exploret robora fumus.

Georg. xi

For that to most *Timber* it contributes much to its duration. Thus do all the *Elements* contribute to the Art of *Seasoning*. The Learned Interpreter of *Antonio Neris* Art of *Glasse* c. 5. speaking of the Difference of *Vegetables*, as they are made use of at various seasons, observes from the *Button-mould-makers* in those woods they use, that *Pear-trees* cut in *Summer* work toughest, but *Holly* in the *Winter*, *Box* hardest about *Easter*, but mellow in *Summer*, *Hawthorn* kindly about *October*, and *Service tree* in the *Summer*.

4. And yet even the greenest *Timber* is sometimes desirable for such as *Carve* and *Turn*; but it choaks the teeth of our *Saws*; and for *Doors*, *Windows*, *Floors*, and other close Works, it is altogether to be rejected; especially, where *Walnut-tree* is the material, which will be sure to shrink: Therefore it is best to choose such as is of two, or three years seasoning, and that is neither moist nor over-dry; the mean is best. Sir *Hugh Plat* informs us that the *Venetians* use to burn, and scorch their *timber* in a flaming fire, continually turning it round with an *Engine*, till they have gotten upon it an hard, black, *coaly* crust; and the Secret carries with it great probability; for that the Wood is brought by it to such a hardness and dryness, *ut cum omnis putrefactio incipiat ab humido*, nor *Earth*, nor *Water* can penetrate it; I my self remembering to have seen *Charcoals* dug out of the ground amongst the ruins of antient Buildings, which have in all probability lain cover'd with earth above 1500 years.

5. *Timber* which is cleft, is nothing so obnoxious to rift and cleave as what is hewn; nor that which is squar'd, as what is round; and therefore where use is to be made of huge and massie Columns, let them be boared through from end to end; it is an excellent preservative from splitting, and not unphilosophical; though to cure this accident, the rubbing them over with a wax-cloth is good, Painters Putty, &c. or before it be converted, the smearing the *timber* over with *Com-dung*, which prevents the effects both of *Sun* and *Air* upon it; if of necessity it must lye expos'd: But besides the former remedies, I find this, for the closing of the chops and clefts of *Green-timber*, to anoint and supple it with the fat of powder'd beef-broth, with which it must be well

well soak'd, the *chasm's* fill'd with *sponges* dipt into it; *this*, to be twice done over: Some *Carpenters* make use of *grease* and *saw-dust* mingled; but the first is so good a way (says my *Author*) that I have seen *Wind-shock-timber* so exquisitely closed, as not to be discerned where the defects were: This must be us'd when the *timber* is green.

6. We spake before of *Squaring*, and I would now recommend the *Quartering* of such *trees* as will allow useful and competent *Scantlings*, to be of much more durableness, and effect for strength, than where (as custome is, and for want of observation) whole *Beams* and *Timbers* are apply'd in *Ships* or *Houses*, with slab and all about them, upon false suppositions of strength beyond these *Quarters*: For there is in all *trees* an evident *Interstice* or separation between the *heart* and the rest of the *body*, which renders it much more obnoxious to decay and miscarry, than when they are treated, and converted as I have describ'd it; and it would likewise save a world of *Materials* in the *Building* of great *Ships*, where so much excellent *timber* is hew'd away to spoyl, were it more in practise. Finally,

7. I must not omit to take notice of the *coating* of *timber* in *Work*, us'd by the *Hollanders* for the preservation of their *Gates*, *Port-cullis's*, *Draw-bridges*, *Sluces*, and other huge *beams* and *Contignations* of *timber* expos'd to the *sun*, and perpetual injuries of the *Weather*, by a certain mixture of *Pitch* and *Tar*, upon which they strew small pieces of *Cockle* and other *shells*, beaten almost to *powder*, and mingled with *Sea-sand*, or the *Scales* of *Iron*, beaten small and sieved, which *incrusts*, and arms it after an incredible manner against all these assaults and foreign invaders: But if this should be deem'd more obnoxious to *Firing*, I have heard that a *Wall* made of *Alume*, has wonderfully protected it against the assaults even of that devouring *Element*, and that so a *wooden Tower* or *Fort* at the *Piræum* an *Athenian Port*, was defended by *Archelaus* a Commander of *Mithridates*, from the great *Sylla*.

8. *Timbers* that you have occasion to lay in *Mortar*, or which is in any part contiguous to *Lime*, as *Doors*, *Window-Cases*, *Ground-sills*, and the extremities of *Beams*, &c. should be cap'd with molten *Pitch*, which will be a marvellous preserver of it from the burning, and destructive effects of the *Lime*; and in defect of *Pitch*, *Loam*, or *Clay* will prove a tollerable defence.

9. For all uses, that *Timber* is esteem'd the best, which is the most *pondrous*, and which lying long, makes deepest *impression* in the *Earth*, or in the *Water* being floated; also what is without *knots*, yet firm, and free from *sap*; which is that fatty, *whiter*, and *softer* part, call'd by the Antients *Alburnum*, which you are diligently to hew away; here we have much adoe about the *Forulus* of the *Fir*, and the *φλοιὸν ὡκεῖον* by both *Vitruvius* and *Theophrastus*, which I passe over. You shall perceive some which has a *spiral* convolution of the *veins*; but it is a vice proceeding from the severity of unseasonable *Winters*, and defect of good nutriment.

10. My

10. My Lord Bacon Exp. 658. recommends for *tryal* of a *sound* or *knotty* piece of *Timber*, to cause one to speak at *one* of the *Extreams* to his Companion listning at the *other*; for if it be *knotty*, the *sound* sayes he, will come abrupt.

11. Moreover, it is expedient that you know which is the *Grain*, and which are the *Veins* in *Timber* (whence the term *fluviani arborem*) because of the difficulty of working against it : Those therefore be the *veins* which grow largest, and are softer for the benefit of *Cleaving*, and *Hewing*; that the *Grain* or *Pectines* which runs in waves, and makes the divers and beautiful *chamfers* which some *woods* abound in to admiration. The *Grain* of *Beech* runs two contrary wayes, and is therefore to be wrought accordingly.

12. Here it may be fitly enquir'd, whether of all the sorts we have enumerated, the *old*, or the *younger* Trees do yield the fairest *Colour*, pleasant *Grain* and *Glosse* for *Wainscot*, *Cabinets*, *Boxes*, *Gun-stocks*, &c. and what kind of *Pear* and *Plum-tree* give the deepest *Red*, and approaches nearest in beauty to *Brass* : 'Tis affirm'd the *Old-Oake*, *Old-Walnut*, and *young-Ash*, are best for most uses; *black*, and *thorny Plum-tree* is of the deepest *Oriency*; but whether these belong to the *Forest*, I am not yet satisfied, and therefore have assigned them no *Chapter* apart.

13. I would also add something concerning what *Woods* are observed to be most *sonorous* for *Musical Instruments* : We as yet detect few but the *German Fir*, which is a *species* of *Maple*, for the *Rimms* of *Viols*, and the choicest and finest grain'd *Fir* for the *Bellyes* : The *finger-boards*, *Back*, and *Ribbs*, I have seen of *Eugh*, *Pear-tree*, &c. But *Pipes*, *Recorders*, and *wind-Instruments*, are made both of hard, and soft *woods*; I had lately an *Organ* with a set of *Oaken-pipes*, which were the most *sweet* and *mellow* that were ever heard; It was a very old *Instrument*, and formerly, I think, belonging to the *Duke of Norfolk*.

14. For the *place* of growth, that *Timber* is esteem'd best which grows most in the *sun*, and on a dry and hale ground; for those *trees* which *suck*, and *drink* little, are most hard, robust, and longest liv'd, instances of *Sobriety*; The *Climate* contributes much to its *quality*, and the *Northern* situation is preferred to the rest of the *quarters*; so as that which grew in *Tuscany* was of old thought better than that of the *Venetian* side; and *trees* of the *wilder kind*, and *barren*, than the over much cultivated, and great bearers: but of this already.

15. To omit nothing, *Authors* have sum'd up the *natures* of *timber*; as the hardest *Ebeny*, *Box*, *Larch*, *Lotus*, *Terebinth*, *Cornus*, *Eugh*, &c. which are best to receive *politure*; and for this, *Lin-seed*, or the sweeter *Nut oyl* does the effect best: *Pliny* gives us the *Receipt*, with a decoction of *Walnut-shales*, and certain *wild pears*: Next to these, *Oak* for *Ships*, and *Houses* (or more minutely) the *Oak* for the *Keel*, the *Robur* for the *Prow*, *Walnut* the *Stern*, *Elm* the *Pump*; *Furnerus* l. 1. c. 22. conceives the *Ark* to have been built of several woods; *Cornel*, *Holly*, &c. for *Pins*, *Wedges*, &c. *Chestnut*, *Horn-*

beam, Poplar, &c. Then for Bucklers, and Targets, were commended the more soft and moist; because apt to close, swell, and make up their wounds again; such as Willow, Lime, Birch, Alder, Elder, Ash, Poplar, &c.

The Robur, or Wild-Oak Timber, best to stand in ground; the *Quercus* without: The Cypress, Fir, Pines, Cedar, &c. for Posts, and Columns, because of their erect growth, natural and comely diminutions. Then again it is noted, that Oriental Trees are hardest towards the Cortex or Bark; our Western towards the middle, which we call the Heart; and that Trees which bear fruit, or but little, are more durable than the more pregnant. It is noted, of Oak, that the knots of an inveterate Tree, just where a lusty arme joyns to the Stem, is as curiously vein'd as the Wall-nut, which omitted in the Chapter of the Oake, I here observe.

Pines, Pitch, Alder, and Elm, are excellent to make Pumps and Conduit-pipes, and for all Water-works, &c. Fir for Beams, Bolts, Bars; being tough, and not so apt to break as the hardest Oak: In sum, the more odoriferous Trees are the more durable and lasting.

16. Here farther for the uses of timber, I will observe to our Reader some other Particulars for direction both of the Seller and Buyer, applicable to the several Species: And first of the two sorts of Lathes allow'd by Statute, one of five, the other of four foot long, because of the different Intervals of Rafters: That of five has 100 to the Bundle, those of four 120; and to be in breadth 1 Inch and $\frac{1}{2}$, and half Inch thick; of either of which sorts there are three, viz. Heart-oak, Sap-Lathes, and Deal Lathes, which also differ in Price: The Heart-oak are fittest to lye under tiling, the second sort, for plastring of side-walls, and the third for Ceilings, because they are streight and even.

17. Here we will gratifie our curious Reader with as curious an Account of the Comparative strength and fortitude of the several usual sorts of timber, as upon Suggestions previous to this Work, it was several times Experimented by the Royal Society, though omitted in the first Impression, because the tryals were not complete as they now thus stand in our Register.

March 23. 1663.

The Experiment of breaking several sorts of Wood was begun to be made: And there were taken three pieces of several kinds; of Fir, Oak, and Ash, each an Inch thick, and two foot long, the Fir weighed $8\frac{1}{16}$ Ounces, and was broken with 200 l. weight: The Oak weigh'd $12\frac{1}{4}$ $\frac{1}{3}$, broken with 250 weight: the Ash weigh'd $10\frac{1}{4}$ $\frac{1}{3}$, broken with 325 weight.

Besides there were taken 3 pieces of the same sorts of wood each of $\frac{1}{2}$ inch thick, and 1 foot long: the Fir weigh'd $j\frac{3}{4}$, and was broken with $\frac{1}{2}$ of an 100: The Oak weigh'd $1\frac{1}{2}$ $\frac{1}{3}$ broken with $\frac{1}{2}$ of an 100: the Ash weigh'd $1\frac{1}{2}$ $\frac{1}{3}$ broken with 100 l.

Again,

Again, there was a piece of *Fir* $\frac{1}{2}$ Inch square, and two foot long, broken with 33 l. A piece of $\frac{1}{2}$ Inch thick 1 Inch broad, and 7 foot long, broken with 100 weight *edge-wise*; And a piece of $\frac{1}{2}$ inch thick, $1\frac{1}{2}$ broad, 2 foot long, broken with 125 weight, also *edge-wise*.

The Experiment was order'd to be repeated by the President, to Sr. William Petty, and Mr. Hook; and it was suggested by some of the Company, that in these tryals consideration might be had of the age, knottiness, solidity, several Soyls, and parts of trees, &c. and Sr. Robert Morray did particularly add, that it might be observ'd how far any kind of Wood bends before it breaks.

March — 64.

The Operator gave an Account of more pieces of wood broken by weight, viz. a piece of *Fir* 4 foot long 2 Inches, 53 Ounce weight, broken with 800 l. weight, and very little bending with 750; by which the Hypothesis seems to be confirm'd, that in similar pieces, the Proportion of the breaking-weight is according to the basis of the wood broken: Secondly, of a piece of *Fir* 2 foot long, 1 Inch square, cut away from the middle both ways to half an Inch, which supported 250 l. weight before it broke, which is more by 50 l. than a piece of the same thickness every way was formerly broken with; the difference was guessed to proceed from the more firmness of this other piece.

His Lordship was desired to contribute to the Prosecution of this Experiment, and particularly, to consider what line a Beam must be cut in, and how thick it ought to be at the Extream, to be equally strong: Which was brought in April 13, but I find it not enter'd.

April 20. 1664.

The Experiment of breaking Wood was prosecuted, and there were taken two pieces of *Fir*, each two foot long, and 1 Inch square, which were broken, the one long-ways with 300 l. weight, the other transverse-ways with 2 $\frac{1}{2}$ hundred: Secondly, two pieces of the same wood, each of $\frac{1}{4}$ of an Inch square, and two foot long, broken, the one long ways with 1 $\frac{1}{4}$ hundred; the other transverse with 100 l. weight: Thirdly, one piece of 2 foot long $\frac{1}{2}$ Inch square, broken longways with 81 l. Fourthly, one piece cut out of a crooked Oken-billet, with an arching Grain, about $\frac{1}{4}$ Inch square, two foot long, broken with $\frac{1}{2}$ hundred.

June 29. 1664.

There were made several Experiments more of breaking wood: First, a piece of *Fir* $\frac{1}{2}$ Inch diameter, and 3 Inches long, at which distance the weight hung, broke in the Plane of the Grain horizontally, with 66 $\frac{1}{2}$ l. whereof 15 l. Troy; Vertically, with 2 l. more. Also *Fir* of $\frac{1}{4}$ Inch diameter, and 1 $\frac{1}{2}$ Inch long, broke vertically with 20 l.

B b 2

and

and horizontally, with 19 l. Elm of $\frac{1}{2}$ Inch diameter, and three inches long, broke horizontally, with 47 l. Vertically with 23 l. Elm of $\frac{1}{4}$ inch diameter, and $1\frac{1}{2}$ Inch long, broke horizontally with 12 l. Vertically with 10 l. which is Note-worthy.

July 6. 1664.

The Experiment of breaking Woods prosecuted: A piece of Oak of $\frac{1}{2}$ Inch diameter and three Inches long, at which distance the weight hung, broke horizontally with 48 l. Vertically with 40 l. Ash of $\frac{1}{2}$ Inch diameter, and 3 Inch long, horizontally with 77 l. Vertically, with 75 l. Ash of $\frac{1}{2}$ Inch diameter, and $1\frac{1}{2}$ Inch long, horizontally with 19 l. Vertically, with 12 l. &c. Thus far the Register.

18. Here might come in the Problemes of Cardinal Cusa in Lib. 4. *Idiota dial.* 4^{to} concerning the different velocity of the Ascent of great pieces of Timber, before the smaller, submerged in water; as also of the weight; as v. g. Why a piece of Wood 100 l. weight, poising more in the Air than 2 l. of Lead, the 2 l. of Lead should seem to weigh (he should say Sink) more in the Water? Why Fruits being cut off from the Tree, weigh heavier, than when they were growing? with several the like Paradoxes, haply more curious than useful, and therefore we purposely omit them.

19. Concerning Squar'd, and Principal Timber for any usual Building, these are the legal Proportions, and which Builders ought not to vary from.

	F.	F.	In.	In.	Feet	Inch	Inch
Summers or Gir- ders from	14 18 to 20 20 23 26	16 20 23 26 28	In length, must be in their Square.	11 13 & 9 14 16 17	8 9 10 12 14	11 10	8 3 3 3 3

	F.	F.	In.	In.	Feet	Inch	Inch
Ending Joys & Trim- ming from	7 to 11	11	In length, must be in their Square	6 7 & 5 8	5 5	Wall-plates and Beams of any length, from 15 foot, may have in their square	7 10 & 6 8

	F.	F.	In.	In.	Feet	Inch	Inch
Purlynes from	15 to 18	18 21	In length, must have in their square	9 12	8 9	9 12	8 9

	F.	F.	In.	In.	Feet	Inch	Inch
Principal Rafter cut Taper from	12 14 18 21 24	14 18 21 24 26	In length must have in their square on one side	8 9 10 12 9	5 7 8 9 9	single Rafter in length from 6 to 9	6 7 8 9 9

	Foot	Inch	Inch
Principal Dischargers of any length from	10	12	12

But Carpenters also work by Square, which is 10 foot in Framing and

and Erecting the *Carcase* (as they call it) of any *Timber* Edifice, which is valued according to the goodnesse and choyce of the *Materials*, and curiosity in *Framing*; especially *Roofs* and *Stayre-cases*, which are of most charges. And here might also something be added concerning the manner of framing the *Carcases* of *Buildings*, as of *Floors*, *pitch* of *Roofs*, the length of *Hips*, and *Sleepers*, together with the names of all those several *Timbers* used in *Fabrics* totally consisting of *Wood*; but I find it done to my hand, and Publish'd some years since, at the end of a late Translation of the first Book of *Palladio*, to which I refer the *Reader*. And to accomplish our *Artist* in *Timber*, with the utmost which that material is capable of; to the Study and Contemplation of that stupendious *Roof*, which now lies over the ever renowned *Sheldonean Theater* at the *University* of *Oxford*; being the sole Work and Contrivement of that my most Honoured Friend *Dr. Chr. Wren*, now worthily dignified with the *Superintendency* of his *Majesties Buildings*.

20. We did, in Chap. 21. mention certain *Subterranean Trees*, which *Mr. Camden* supposes grew altogether under the ground: And truly, it did appear a very *Paradox* to me, till I both saw, and diligently examin'd that piece (*Plank*, *Stone*, or both shall I name it) of *Lignum fossilis* taken out of a certain *Quarry* thereof at *Aqua Sparta* not far from *Rome*, and sent to the most incomparably learned *Sir George Ent*, by that obliging *Virtuoso Cavalier dal Pozzo*. He that shall examine the *hardnesse*, and feel the *ponderousnesse* of it, sinking in *water*, &c. will easily take it for a *stone*; but he that shall behold its *grain*, so exquisitely undulated, and varied together with its *colour*, manner of *hewing*, *chips*, and other most perfect resemblances, will never scruple to pronounce it arrant *wood*.

Signor Steluti (an *Italian*) has publish'd a whole *Treatise* expressly to describe this great *Curiosity*: And there has been brought to our notice, a certain relation of an *Elm* growing in *Bark-shire* near *Farrington*, which being cut towards the *Root*, was there plainly *Petrified*; the like, as I once my self remember to have seen in another *Tree*, which grew quite through a *Rock* near the *Sepulchre* of *Agrippina* (the *Mother* of that *Monster Nero*) at the *Baia* by *Naples*, which appear'd to be all *Stone*, and trickling down in drops of *Water*, if I forget not. But, while others have *Philosophiz'd* according to their manner upon these extraordinary *Concretions*; see what the most industrious, and knowing *Mr. Hook*, *Curator* of this *Royal Society*, has with no lesse *Reason*, but more *succinctnesse*, observ'd from a late *Microscopical* Examen of another piece of *petrified wood*; the Description, and Ingenuity whereof cannot but gratifie the *Curious*, who will by this *Instance*, not onely be instructed how to make *Inquiries* upon the like occasions; but see also with what *accuratenesse* the *Society* constantly proceeds in all their *Indagations*, and *Experiments*; and with what *Candor* they relate, and communicate them.

21. "It resembl'd *wood*, in that

"First,

"First, all the parts of the *petrified* substance seem'd not at all dislocated, or alter'd from their natural position whiles they were *wood*; but the whole piece retain'd the exact shape of *wood*, having many of the conspicuous *pores* of *wood* still remaining *pores*, and shewing a manifest difference visible enough between the *grain* of the *wood* and that of the *bark*; especially, when any side of it was cut smooth and polite; for then it appeared to have a very lovely *grain*, like that of some curious close *wood*.

"Next (it resembled *wood*) in that all the smaller and (if so I may call those which are onely to be seen by a good glasse) *microscopical* pores of it, appear (both when the substance is cut and polish'd *transversely*, and *parallel* to the pores) perfectly like the *Microscopical* pores of several kinds of *wood*, retaining both the shape, and position of such pores.

"It was differing from *wood*.

"First, in *weight*, being to common *water*, as $3\frac{1}{4}$ to 1. whereas there are few of our *English* woods that, when dry, are found to be full as heavy as *water*.

"Secondly, in *hardnesse*, being very near as hard as a *flint*, and in some places of it also resembling the grain of a *flint*: it would very readily cut *Glass*, and would not without difficulty (especially in some parts of it) be scratch'd by a black hard *flint*: it would also as readily strike *fire* against a *Steel*, as also against a *flint*.

"Thirdly, in the *closefinesse* of it; for, though all the *microscopical* pores of the *wood* were very conspicuous in one position, yet by altering that position of the polish'd surface to the light, it also was manifest that those pores appear'd darker than the rest of the body, onely because they were fill'd up with a more dusky substance, and not because they were hollow.

"Fourthly, in that it would not *burn* in the *fire*; nay, though I kept it a good while red-hot in the flame of a *Lamp*, very intently cast on it by a *blast* through a small *pipe*; yet it seemed not at all to have diminish'd its extension; but onely I found it to have chang'd its colour, and to have put on a more dark, and dusky brown *hue*. Nor could I perceive that those parts which seem'd to have been *wood* at first, were any thing wasted, but the parts appear'd as solid, and close as before. It was farther observable also, that as it did not consume like *wood*; so neither did it crack and fly like a *flint*, or such like hard *stone*; nor was it long before it appeared *red-hot*.

"Fifthly, in its *dissolublenesse*; for putting some drops of *distilled Vinegar* upon the *stone*, I found it presently to yield very many *bubbles*, just like those which may be observed in *spirit of Vinegar* when it corrodes *Coral*; though I guess many of those *bubbles* proceeded from the small parcels of *Air*, which were driven out of the pores of this *petrified* substance, by the insinuating liquid *menstruum*.

"Sixtly, in its *Rigidnesse*, and *friability*; being not at all *flexible*,

“ble, but brittle like a *flint*; infomuch that with one knock of a
 “*Hammer* I broke off a small piece of it, and with the same *Ham-*
 “*mer* quickly beat it to pretty fine powder upon an *Anvil*.

“Seventhly, it seem’d also very differing from *wood* to the touch,
 “feeling more cold then *wood* usually does, and much like other
 “close *Stones* and *Minerals*.

“The *Reasons* of all which *Phanomena* seem to be.

“That this petrified wood having lain in some place where it was
 “well soaked with petrifying water (that is, such a water as is well
 “impregnated with stony and earthy particles) did by degrees se-
 “parate, by straining and filtration, or perhaps by precipitation,
 “co-hesion or coagulation, abundance of stony particles from that
 “permeating water, which stony particles having, by means of the
 “fluid Vehicle, convey’d themselves not onely into the microscopi-
 “cal pores, and perfectly stop’d up them; but also into the pores,
 “which may perhaps be even in that part of the wood which
 “through the microscope appears most solid; do thereby so aug-
 “ment the weight of the wood, as to make it above three times
 “heavier than water, and perhaps six times as heavy as it was when
 “wood: next, they hereby so lock up and fetter the parts, of the
 “wood, that the fire cannot easily make them fly away, but the acti-
 “on of the fire upon them is onely able to char those parts, as it
 “were, like as a piece of wood if it be closed very fast up in Clay,
 “and kept a good while red hot in the fire, will by the heat of the
 “fire be char’d, and not consum’d; which may perhaps be the rea-
 “son why the petrified substance appear’d of a blackish brown col-
 “our after it had been burnt. By this intrusion of the petrified
 “particles it also becomes hard, and friable; for the smaller pores
 “of the wood being perfectly stuffed up with these stony particles,
 “the particles of the wood have few, or no pores in which they can
 “reside, and consequently, no flexion or yielding can be caus’d in
 “such a substance. The remaining particles likewise of the wood
 “among the stony particles may keep them from cracking and fly-
 “ing, as they do in a flint.

22. The casual finding of *Subterraneous-Trees* has been the oc-
 casion of this curious *Digression*: Now it were a strange *Paradox*
 to affirm, that the *Timber* under the ground, should to a great degree,
 equal the value of that which grows above the *Ground*; seeing
 though it be far lesse, yet it is far Richer; the *Roots* of the vilest
Shrub, being better for its toughnesse, and for *Ornaments*, and deli-
 cate uses much more preferrable than the *Heart* of the fairest and
 soundest *Tree*: And many *Hills*, and other waste-places, that have
 in late and former *Ages* been stately *Groves* and *Woods*, have yet
 this *Treasure* remaining, and perchance sound and unperish’d, and
 commonly (as we observ’d) an hinderance to other *Plantations*;
Engines therefore, and *Expedients* for the more easily extracting
 these *Cumbrances*, and making riddance upon such Occasions, be-
 sides those we have produc’d, would be excogitated, and enquir’d
 after, for the dispatch of this difficult Work.

23. Finally,

Fuel.

23. Finally, for the use of our *Chimneys*, and maintenance of *fire*, the plenty of *wood* for *fuel*; rather than the *quality* is to be looked after; and yet there are some greatly to be preferr'd before others, as *harder*, *longer-lasting*, better *heating*, and chearfully *burning*; for which we have commended the *Asb*, &c. in the foregoing *Paragraphs*, and to which I pretend not here to add much, for the avoiding repetitions; though even an *History* of the best way of *Charing* would not mis-become this *Discourse*.

But something more is to be said sure, concerning the *selling* of *Fuel-wood*: Note therefore, that you first begin with the *under-wood*: Some conceive between *Martle-mas* and *Holy-Rood*; but, generally with *Qake* as soon as 'twill strip, but not after *May*; and for *Asbes*, 'twixt *Michael-mas* and *Candle-mas*; and so fell'd, as that the *Cattel* may have the *browsing* of it, for in *Winter* they will not onely eat the tender *twiggs*, but even the very *Mosse*; but fell no more in a day than they can Eat for this purpose: This done, *kid* or *bavin* them, and pitch them upon their ends to preserve them from rotting: Thus the *Under-wood* being dispos'd of, the rest will prosper the better, and besides it otherwise does but rot upon the Earth, and destroy that which would spring. If you *head* or *top* for the *fire*, 'tis not amiss to begin three or four foot above the *Timber*, if it be considerable; but in case they are onely *shaken-Trees* and *Hedge-rows*, strip them even to thirty foot high, because they are usually full of *boughs*; and 'twere good to top such as you perceive to wither at the *tops* a competent way beneath, to prevent their sicknesse downwards, which will else certainly ensue; whereas by this means even *dying Trees* may be preserved many years to good emolument, though they never advance *taller*; and being thus frequently shred, they will produce more, than if suffered to stand and decay: This is a profitable *note* for such as have old, doating, or any wayes infirm *Woods*: In other *Fellings*, some advise never to commence the disbranching from the *top*, for though the incumbency of the very *boughs* upon the *next*, cause them to fall off the easier, yet it endangers the splicing of the next, which is very prejudicial, and therefore advise the begining at the nearest. And in *Cutting* for *fuel* you may as at the *top*, so at the *sides*, cut a *foot*, or more from the *Body*; but never when you shred *Timber-Trees*: We have said how dangerous it is, to cut for *wood* when the *Sap* is up, it is a mark of improvident *Husbands*; besides it will never burn well, though abundance be congested: Lastly, remember that *East* and *North-winds* are unkind to the succeeding *Shoots*. Now for directions in *Stacking* (of which we have said something in *Chap. of Copses*) ever set the *lowest* course an *end*, the *second* that on the *sides* and *ends*, viz. *sides* and *ends* outward; the *third* thwart the other on the *side*, and so the rest, till all are plac'd, spending the up-most first.

Thus we have endeavour'd to prescribe the best directions we could learn concerning this necessary Subject. And in this penury of that dear Commodity, and to incite all ingenious persons, studious

studious of the benefit of their *Countrey*, to think of wayes how our *Woods* may be preserved, by 'all manner of *Arts* which may prolong the lasting of our *fuel*, I would give the best encouragements. Those that shall seriously consider the intollerable misery of the poor *Cauchi* (the then Inhabitants of the *Low Countries*) describ'd by *Pliny*, lib 16. cap. 1. (how opulent soever their late *Industry* has render'd them) for want only of *wood* for *fuel*, will have reason to deplore the excessive decay of our former store of that useful Commodity; and by what shifts our Neighbours the *Hollanders*, do yet repair that defect, be invited to exercise their ingenuity: For besides the *Dung* of *Beasts*, and the *Peat* and *Turf* for their *Chimneys*, *Cow sheardes*, &c. they make use of *Stoves* both portable and standing; and truly the more frequent use of those *Inventions* in our great, wasting *Cities* (as the Custom is through all *Germany*) as also of those new, and excellent *Ovens* invented by Dr. *Kessler*, for the incomparably baking of *Bread*, &c. would be an extraordinary expedient of husbanding our *fuel*; as well as the right mingling, and making up of *Char-coal-dust*, and *loam*, as 'tis hinted to us by Sir *Hugh Plat* and is generally us'd in *Mastricht*, and the *Countrey* about it; than which there is not a more sweet, lasting, and beautiful *fuel*; The manner of it is thus:

24. Take about one *third part* of the smallest of any *Coal*, *Pit*, *Sea*, or *Char coal*, and commix them very well with *loam* (whereof there is in some places to be found a sort somewhat more combustible) make these up into *balls* (moistned with a little *Urine* of *Man* or *Beast*) as big as an ordinary *Goose-egge*, or somewhat bigger; or if you will in any other form, like *brick-bats*, &c. expose these in the *Air* till they are thoroughly dry; they will be built into the most orderly *fires* you can imagine, *burn* very clear, give a wonderfull heat, and continue a very long time. But first you must make the *fire* of *Char-coal*, or *Small-coal*, covering them with your *Eggs* or *Hovilles* (as they are call'd) and building them up in *Pyramis*, or what shape you please; they will continue a glowing, solemn and constant *fire* for seven or eight *hours* without being stirred, and then they encourage and recruite the innermost vvith a fevv fresh *Eggs*, and turn the rest, vvhich are yet quite reduc'd to *Cinders*.

Two or three short *Billets* cover'd with *Char-coal* last much longer, and with more life, than twice the quantity by it self, whether *Char-coal* alone, or *Billet*; and the *Billets* under the *Char-coal* being undisturb'd, will melt as it were into *Char-coals* of such a lasting size.

If *Small-coals* be spread over the *Char coal*, where you burn it alone, 'twill bind it to longer continuance; and yet more, if the *Small coal* be made of the roots of *Thorns*, *Briets*, and *Brambles*. Consult *L. Bacon*, Exp. 775.

25. The *Quercus Marina*, *Wrack*, or *Sea-weed* which comes in our *Oyster barrels*, laid under *New-Castle-coal* to kindle it (as the use is in some places) will (as I am inform'd) make it out-last

two great *fires* of simple *Coals*, and maintain a glowing *luculent* heat without wast: The manner of *gathering* it is to *cut* it in *Summer* time from the *Rocks* whereon it grows abundantly, and bringing it in *Boats* or otherwise to *Land*, *spread* and *dry* it in the *Sun* like *hay*, turning and cocking it till it be fully *cured*: It makes an excellent *fire* alone, and *roasts* to admiration; and when all is *burnt*, the *Ashes* are one of the best *manures* for *Land* in the world, for the time it continues its virtue, which should be frequently supplied with fresh; and as to the *Fire* mingled with other *Combustibles*, it is evident that it adds much life, continuance and aid, to our *ful-len Sea-coal Fuel*; and if the main *Ocean* should afford *Fuel* (as the *Bernacles* and *Soland-Geese* are said to do in some parts of *Scotland* with the very *sticks* of their *Nests*) we in these *Isles* may thank our selves if we be not warm: These few particulars I have but mention'd to animate *Improvements*, and ingenious Attempts of detecting more cheap, and useful *processes*, for wayes of *Charing-Coals*, *Peat*, and the like *fuliginous* materials; as the accomplished Mr. *Boyle* has intimated to us in the *Fift* of those his precious *Essays* concerning the *usefulness* of *Natural Philosophy*, *Part 2, cap. 7. &c.* to which I refer the Curious.

26. By the *Preamble* of the *Statute 7 Ed. 6.* one may perceive (the *Measures* compar'd) how plentiful *fuel* was in the time of *Ed. the 4th*, to what it was in the *Reigns* of his *Successors*: This suggested a review of *Sizes*, and a reformation of *Abuses*; in which it was *Enacted*, that every *Sack* of *Coals* should contain *four Bushels*; Every *Taleshide* to be *four foot* long, besides the *carf*; and if nam'd of *one, marked* one, to contain *16 inches circumference*, within a foot of the middle; If of *two marks*, *23 inches*; of *3, 28. of 4, 35*; of *5, 38. inches about*, and so proportionably.

27. *Billets* were to be of *three foot*, and *four inches* in length: the single to be *17 inches* and an half about; and every *Billet* of one *cast* (as they term the mark) to be *ten inches* about: of two *cast*, *fourteen inches*, and to be marked (unless for the private use of the *Owner*) within *six inches* of the middle: of one *cast* within *four inches* of the end &c.

Every bound *Fagot* should be *three foot* long; the *band* *twenty four inches circumference*, besides the knot.

In the *43. Eliz.* the same *Statute* (which before only concern'd *London* and its *Suburbs*) was made more universal; and that of *Ed. 6.* explain'd with this addition: For such *Taleshides* as were of necessity to be made of *cleft-wood*, if of *one mark*, and half round, to be *19 inches* about; if quarter-cleft *18 inches*; Marked *two*, being round it shall be *23 inches* compass: half-round *27*: quarter-cleft *26*: marked *three*, round *28*: half-round *33*: quarter-cleft *32*: marked *four*, being round *33 inches* about: half round *39*: quarter-cleft *38*: marked *five* round, *38 inches* about: half-round *44*: quarter-cleft *43*: the measure to be taken within half a foot of the middle of the length mention'd in the former *Statute*.

Then

Then for the *Billet*, every one nam'd a *single*, being round, to have 7 inches $\frac{1}{2}$ *circumference*; but no *single* to be made of cleft wood: If marked *one*, and round, to contain 11 inches compasse: if half-round 13: quarter-cleft 12 $\frac{1}{2}$.

If marked *two*, being round, to contain 16 inches: half-round 19: quarter-cleft 18 $\frac{1}{2}$: the length as in the *Statute* of King Edward 6.

28. *Fagots* to be every stick of *three foot* in length, excepting onely one stick of one foot long, to harden and wedge the binding of it: This, to prevent the abuse (too much practis'd) of filling the middle part, and ends with trash, and short sticks, which had been omitted in the former *Statute*: concerning *this* and of the *dimensions* of wood in the *Stack*, see Chap. 28. to direct the lesse instructed *Purchaser*: and I have been the more particular upon this occasion; because, than our *Fuel* bought in *Billet* by the *Notch* (as they call it in *London*) there is nothing more deceitful; for by the vile iniquity of some *Wretches*, marking the *billets* as they come to the *Wharf*, Gentlemen are egregiously cheated. I could produce an instance of a *Friend* of mine (and a *Member* of this *Society*) for which the *Wood-monger* has little cause to brag; since he never durst come at him, or challenge his *Money* for the *Commodity* he bought; because he durst not stand to the *measure*.

At *Hall* near *Foy*, there is a *Fagot*, which consists but of *one* piece of *Wood*, naturally grown in that form, with a *band* wrapped about it, and parted at the ends into *four sticks*, one of which is subdivided into *two* others: It was carefully preserved many years by an *Earl* of *Devonshire*, and looked on as portending the *fate* of his *Posterity*, which is since indeed come into the hands of *four Cornish* Gentlemen, one of whose *Estates* is likewise divided 'twixt two *Heirs*. This we have out of *Cambden*, and I here *note*, for the *Extravagancy* of the thing; though as to the verity of such *Portents* from *Trees*, &c. I do not find (upon enquiry, which I have diligently made of my Lord *Brereton*) that there is any certainty of the rising of those *Logs* in the *Lake* belonging to that Noble *Person*, so as still to premonish the *Death* of the *Heir* of that *Family*, how confidently soever reported. Sometimes it has happen'd, but the *Tradition* is not constant: To this *Classe* may be referred what is affirmed concerning the fatal *Prediction* of *Oakes* bearing strange *leaves*, which may be enquired of.

29. But I will now describe to you the *Mystery* of *Charing* (whereof something was but touch'd in the *Processe* of extracting *Tar* out of the *Pines*) as I receiv'd it from a most industrious *person*, and so conclude the *Chapter*.

There is made of *Char-coal* usually *three* sorts, *viz.* *one* for the *Iron-works*, a *second* for *Gun-powder*, and a *third* for *London* and the *Court*, besides *Small-coals*, of which we shall also speak in its due place.

We will begin with that sort which is us'd for the *Iron-works*, because the rest are made much after the same manner, and with very little difference.

The best *Wood* for this is good *Oak*, cut into lengths of three foot, as they size it for the *Stack*: This is better than the *Cord-wood*, though of a large measure, and much us'd in *Essex*.

The *Wood* cut, and set in *Stacks* ready for the *Coaling*, chu'e out some level place in the *Copse*, the most free from stubs, &c. to make the *Hearth* on: In the midst of this area drive down a stake for your *Centre*, and with a *pole*, having a *ring* fasten'd to one of the extreame (or else with a *Cord* put over the *Centre*) describe a *Circumference* from twenty, or more feet *semidiameter*, according to the quantity of your *Wood* design'd for *Coaling*, which being neer may conveniently be *Chared* in that *Hearth*; and which at one time may be 12, 16, 20, 24, even to 30 *stack*: If 12 therefore be the quantity you will *Coal*, a *Circle* whose *diameter* is 24 foot, will suffice for the *Hearth*; If 20 *stack*, a *diameter* of 32 foot; If 30, 40 foot, and so proportionably.

Having thus marked out the ground, with *Mattocks*, *Haws*, and fit Instruments, bare it of the *Turf*, and of all other combustible stuff whatsoever, which you are to rake up towards the *Peripherie*, or out-side of the *Circumference*, for an use to be afterwards made of it; plaining, and levelling the ground within the *Circle*: This done, the *Wood* is to be brought from the nearest parts where it is *stack'd*, in *Wheel-barrows*; and first the smallest of it plac'd at the utmost limit, or very margin of the *Hearth*, where it is to be set long-ways, as it lay in the *stack*; the biggest of the *Wood* pitch, or set up on end round about against the *small-wood*, and all this within the *circle*, till you come within five, or six foot of the *Centre*; at which distance you shall begin to set the *Wood* in a *Triangular* form (as in the following *Print*, a) till it come to be three foot high: Against this again, place your greater *Wood* almost perpendicular, reducing it from the *triangular* to a *circular* form, till being come within a yard of the *Centre*, you may Pile the *Wood* long-ways, as it lay in the *Stack*, being careful that the ends of the *Wood* do not touch the *Pole*, which must now be erected in the *Centre*, nine foot in height, that so there may remain a round hole, which is to be form'd in working up the *Stack wood*, for a *Tunnel* and the more commodious *firing* of the *pit*, as they call it, though not very properly. This provided for, go on to *Pile*, and set your *Wood* upright to the other, as before; till having gain'd a yard more, you lay it long-ways again, as was shew'd: And thus continue the Work, still enterchanging the *position* of the *Wood*, till the whole *Area* of the *Hearth* and *Circle* be fill'd, and pil'd up at the least eight foot high, and so drawn in by degrees in *Piling*, that it resemble the form of a copped brown *Household-loaf*, filling all inequalities with the smaller *Trunchions*, till it lye very close, and be perfectly, and evenly shaped. This done, take *straw*, *haume*, or *ferne*, and lay it on the out-side of the bottome of the heap, or wood, to keep the next cover from falling amongst the sticks: Upon this, put on the *Turf*, and cast on the *dust* and *Rubbish* which was grubb'd, and raked up at the making of the *Hearth*,
and

and reserved near the *circle* of it; with *this* cover the whole heap of *Wood* to the very top of the *Pit*, or *Tunnel*, to a reasonable, and competent thicknesse, beaten close and even, that so the *fire* may not *vent* but in the places where you intend it; and if in preparing the *Hearth*, at first, there did not rise sufficient *Turf* and *Rubbish* for this Work, supply it from some convenient place near to your *heap*: There be who cover this again with a *sandy*, or finer mould, which if it close well, need not be above an *inch* or two thick: This done, provide a *Screene*; by making light *hurdles* with *slit rods*, and *straw* of a comper thicknesse, to keep off the *Wind*, and broad, and high enough to defend an opposite side to the very top of your *Pit*, being eight or nine foot; and so as to be easily remov'd as need shall require for the *living* of your *pit*.

When now all is in this posture, and the *Wood* well rang'd, and clos'd, as has been directed, set *fire* to your *heap*: But first you must provide you of a *Ladder* to ascend the top of your *Pit*: this they usually make of a curved *Tiller* fit to apply to the *convex* shape of the *Heap*, and cut it full of notches for the more commodious setting their Feet, whiles they govern the *Fire* above; therefore now they pull up, and take away the *Stake* which was erected at the *centre* to guid the building of the *Pile*, and cavity of the *Tunnel*. This done, put in a quantity of *Char-coals* (about a *peck*) and let them fall to the bottom of the *Hearth*; upon them cast in *coals* that are fully kindled; and when those which were first put in are beginning to sink, throw in more *fuel*; and so, from time to time, till the *Coals* have universally taken *fire* up to the top: Then cut an ample and reasonable thick *Turf*, and clap it over the hole, or *mouth* of the *Tunnel*, stopping it as close as may be with some of the former dust and rubbish: Lastly, with the handles of your *Rakers*, or the like, you must make *Vent-holes*, or *Registers* (as our *Chymists* would name them) through the stuff which covers your *Heap* to the very *Wood*, these in ranges of two or three foot distance quite round within a foot (or thereabout) of the *top*, though some begin them at the *bottom*: A day after, begin another row of *holes* a foot and half beneath the former; and so more, till they arrive to the ground, as occasion requires. Note, that as the *Pit* does *coal* and *sink* towards the *centre*, it is continually to be fed with short, and fitting *Wood*, that no part remain *unfir'd*; and if it *chars* faster at one part than at another, there close up the *vent-holes*, and open them where need is: A *Pit* will in this manner be burning off, and *charing*, five, or six dayes, and as it *coals*, the *smoke* from thick and gross clouds, will grow more blew, and livid, and the whole mass sink accordingly; so as by these indications you may the better know how to stop, and govern your *spiracles*. Two or three dayes it will onely require for *cooling*, which (the *vents* being stopp'd) they assist, by taking now off the outward covering with a *Rabil* or *Rubber*; but *this*, not for above the space of one *yard* breadth at a time; and first they remove

move the coursest, and grossest of it, throwing the finer over the heap again, that so it may neither cool too hastily, nor endanger the burning and reducing all to *Ashes*, should the whole *Pit* be uncover'd and expos'd to the *Air* at once; therefore they open it thus round by degrees.

When now by all the former *Symptoms* you judge it fully char'd, you may begin to draw; that is, to take out the *Coals*, first round the bottom, by which means the *Coals*, *Rubbish* and *Dust* sinking and falling in together may choak, and extinguish the fire.

Your *Coals* sufficiently cool'd, with a very long-tooth'd *Rake*, and a *Vann*, you may load them into the *Coal-Wains*, which are made close with boards, purposely to carry them to *Market*: Of these *Coals* the grosser sort are commonly reserv'd for the *Forges*, and *Iron-works*; the middling and smoother put up in *Sacks*, and carried by the *Colliers* to *London* and the adjacent *Towns*; those which are char'd of the *Roots*, if pick'd out, are accounted best for *Chymical* fires, and where a lasting, and extraordinary blast is requir'd.

30. Coal for the *Powder Mills* is made of *Alder-wood* (but *Lime-tree* were much better had we it in that plenty as we easily might) cut stack'd, and set on the *Hearth* like the former: But first, ought the wood to be wholly disbark'd (which work is to be done about *Mid-summer* before) and being thoroughly dry, it may be Coaled in the same method, the *Heap* or *Pits* onely somewhat smaller, by reason that they seldom coal above five, or six stacks at a time, laying it but two lengths of the wood one above the other, in form somewhat flatter on the top than what we have described. Likewise do they fling all their *Rubbish* and *Dust* on the top; and begin not to cover at the bottom, as in the former example. In like sort, when they have drawn up the fire in the *Tunnel*, and stopp'd it, they begin to draw down their dust by degrees round the heap; and this proportionably as it fires, till they come about to the bottom; all which is dispatch'd in the space of two dayes. One of these Heaps will char threescore Sacks of Coal, which may all be carried at one time in a *Wagon*; and some make the *Court-coals* after the same manner. Lastly,

31. Small-coals are made of the *Spray*, and *Brush-wood* which is shipped off from the branches of *Copse-wood*, and which is sometimes bound up into *Bavins* for this use; though also it be as frequently char'd without binding, and then they call it cooming it together: This, they place in some near floor, made level, and freed of incumbrances, where setting one of the *Bavins* or part of the *spray* on fire, two men stand ready to throw on *Bavin* upon *Bavin* (as fast as they can take fire, which makes a very great and sudden blaze) till they have burnt all that lyes near the place, to the number (it may be) of five, or six hundred *Bavins*: But ere they begin to set fire, they fill great *Tubs* or *Vessels* with water, which stand ready by them, and this they dash on with a great

great *dish* or *scoop*, so soon as ever they have thrown on all their *Bavins*, continually plying the great *heap* of glowing *Coals*, which gives a sudden stop to the fury of the *Fire*, whiles with a great *Rake* they lay, and spread it abroad, and ply their casting of *Water* still on the *Coals*, which are now perpetually turn'd by two men with great *Shovels*, a third throwing on the *water* : This they continue till no more *Fire* appears, though they cease not from being very hot : After this, they *shovel* them up into great *heaps*, and when they are throughly *cold*, put them up in *Sacks* for *London*, where they use them amongst divers *Artificers*, both to kindle greater *Fires*, and to temper, and *aneal* their several Works.

32. The best *Season* for the fetching home of other *Fuel*, is from *June* ; the *Ways* being then most dry, and passable, yet I know some good *Husbands* will begin rather in *May* ; because *Fallowing* and stirring of Ground for *Corn*, comes in the ensuing *Monthes*, and the *Dayes* are long enough, and *Swaines* have then least to do.



b The Central Pole or place of the Tunnel with the Area making ready.

a The Wood plac'd about it in Triangle.

c The Coal Wood pil'd up before it be covered with Earth.

d The Coal-pit or Pile fir'd.

33. And

33. And thus we have seen how for *Honse-boot*, and *Ship-boot*, *Plow boot*, *Hey-boot*, and *Fire-boot*, the *Planting*, and *Propagation* of *Timber* and *Forest Trees* is requisite; so as it was not for nothing, that the very *Name* (which the *Greeks* generally apply'd to *Timber*) *ῥύλον*, by *Senechdoche*, was taken always *pro Materia*; since we hardly find any thing in *Nature* more universally *useful*; or, in comparison with it, deserving the name of *Material*.

34. Lastly, to complete this *Chapter* of the *universal Use* of *Trees*, and the *Parts* of them, something I could be tempted to say concerning *Staves*, *Wands &c.* Their *Antiquity*, *Use*, *Divine*, *Domestic*, *Civil*, and *Political*; the time of *Cutting*, manner of *Seasoning*, *Forming*, and other curious particulars (how dry soever the *Subject* may appear) both of *Delight* and *Profit*: but we reserve it for some more fit opportunity, and perhaps, it may merit a peculiar *Treatise*, as acceptable, as it will prove divertisant. In stead of this, we will therefore gratifie our *Reader* with some no inconsiderable *Secrets*: But first we will begin with a few plain *Directions* for such Persons and *Countrey Gentlemen*, as being far distant from, or unhand somely impos'd upon by common *Painters*, may be desirous to know how to *Stop*, *Prime*, and *Paint* their *Timber-work* at home, and save the *Expense* of *Work* by any of their *Servants* indu'd with an ordinary Capacity.

Putty to stop the *chaps* and *cracks* of wrought *Timber*, is made of *White* and *Red-lead*, and some *Spannish-white* (not much) temper'd, and bruised with so much *Lin-seed Oyl* as will bring it to the Consistence of a *Past*. Then,

Your first *Priming* shall be of *Oaker* and *Spannish-white*, very thinly ground: The *second* with the same, a little *Whiter*; but it matters not much. The *third* and last, with *White-lead* alone; some mingle a little *Spannish-white* with it, but it is better omitted. If you desire it exquisite, instead of *Lin-seed Oyl*, use that of *Wall-nuts*: But the ordinary *Stone-colour* for grosse work, expos'd to the *Air*, may be of lesse *Expense*, with the more ordinary *Oyl*, to which you may add a little *Char-coal* in the *Grinding*.

Blew, is made of *Indigo*, with a small addition of *Red-lead*, or *Verdigreese* for a *dryer*; unless you will use *drying-Oyl*, which is much preferable, and is made of *Lin-seed Oyl* boyl'd with a little *Umber* bruised small: I speak nothing here of *Smalt* and *Byce*, which is onely done by *Strewing*.

Green, with *Verdigreece* ground with *Lin-seed Oyl* pretty thick, and then temper'd with *Joyners Vernish* in a glaz'd *Pot* of *Earth* (the best to preserve your *Colours* in) till it run somewhat thin; and just touch it with your *Brush*, when you lay it on, having *Prim'd* it the *second* time with *White*.

Note, that every *Primer* must be dry, before you go it over again.

If you will *Re-vaile*, as they term it, and shadow, or Vein your *Stone-colour*, there is a *Colour* call'd *Shadowing-Black*; or you may now and then lightly touch it with a little *Red-lead*; or work with *Umber*.

It

It will also behove you to have a good smooth *Slat*, and a *Pibble Muller* well polish'd, which may be bought at *London*; as likewise a dozen of large, and lesser *Brushes*, and *Glaz'd Pots*; and to grind the *Colours* perfectly well. The *Spanish-white* requires little labour; the *Shadowing Black*, none at all.

When you have finish'd, wash your *Brushes* with warm *Water* and a little *Sope*: Preserve your *Oyl* in *Bladders*; and what *Colour* you leave, plunge the *Pots* into fair *Water*, so as they may stand a little cover'd in it, which will keep them from growing dry, till you have occasion for them. That you may not be altogether ignorant of the *charge*, and *Price* of the *Ingredients*, which seldom varies:

Cleer, and sweet *Lin-seed Oyl* is usually had for 4 s. per Gallon.

Spruce-Oaker, of all sorts to *Prime* with, 3 s. per Pound.

Spanish white, for half a Penny: *White lead* 3 d. per Pound.

Vert-de-Greece, clean and bright, 3 s. per Pound. *Black* to shadow with, exceeding cheap. *Joyners Vernish*, 6 d. per Pound. So as for farther direction; of *White-lead* six pound, *Span. white* six pound, *Spruce-Oker* three pounds, *Vert-de-Greece* half a pound; *Vernish* one pound, *Shadowing-black* half a pound, &c. will serve one for a pretty deal of *Work*, and easily inform what quantities you should provide for a greater, or lesser occasion.

We will next impart a *Receipt* for a cheap *Black-dye*, such yet as no *Weather* will fetch out, and that may be of use both within and without doors, upon *Wainscot*, or any fine *Timber*, as I once apply'd it to a *Coach* with perfect success.

Take of *Galls*, grossly contus'd in a *Stone Mortar* one pound; boyle them in three quarts of *White-wine Vinegar* to the diminution of one part, two remaining: With this, rub the *Wood* twice over; Then, take of the *Silk Diers black*, liquid (cheap, and easie to be had) a convenient quantity, mix it at discretion with *Lamp-black* and *Aqua-vitæ*, sufficient to make it thin enough to pass a *Strainer*: With this, die over your *Work* again; and if at any time it be stain'd or spotted with dirt, &c. rubbing it only with a *Wollen-cloth* dip'd in *Oyl*, it will not onely recover, but present you with a very fair and noble polish. There is a *Black*, which *Joyners* use to tinge their *Pear-tree* with, and make it resemble *Ebony*, and likewise *Fir*, and other *Woods* for *Cabinets*, *Pictures-Frames*, &c. which is this.

Take *Log-wood* q. s. boyl it in ordinary *Lye*, and with this paint them over: when 'tis dry, work it over a second time with *Lamp-black* and strong *Size*: That also dry, rub off the dusty *Sootiness* adhering to it, with a soft *Brush*, or *Cloth*; then melt some *Bees-wax*, mixing it with your *Lamp-black* and *Size*, and when this is cold, make it up into a *Ball*, and rub over your former *Black*: Lastly, with a *Polishing brush* (made of short stiff *Boars Bristles*, and fastned with *Wyre*) labour it till the *Lustre* be to your liking. But,

The black *Pntty*, wherewith they stop, and fill up cracks and
D d fissures,

fissures in *Ebony*, and other fine *wood*, is compos'd of a part of the purest *Rosin*, *Bees-wax*, and *Lamp-black* : This they heat and drop into the *Crannies* ; then with an *hot-Iron*, glaze it over, and being cold, scrape it even with a sharp *Chisel*, and after all, polish it with a *Brush* of *bents*, a *wollen-cloth*, *Felt*, and an *Hogs-hair Rubber* : *Allo Mastic* alone, mingled with a proper *Colour* is of no lesse effect.

35. We conclude all, with that incomparable *Secret* of the *Japon* or *China-Vernishes*, which has hitherto been reserv'd so choicely among the *Virtuosi*; with which I shall suppose to have abundantly gratified the most curious employers of the finer *woods*.

Take a *Pint* of *Spirit of Wine* exquisitely *dephlegm'd*, four *Ounces* of *Gum-Lacq*, which thus cleanse : break it first from the sticks and rubbish, and roughly contusing it in a *Mortar*, put it to steep in *Fountain water*, ti'd up in a *bag* of course *Linnen*, together with a very small morsel of the best *Castle-Sope*, for 12 hours; then rub out all the *tincture* from it, to which add a little *Alum*, and reserve it apart : The *Gum-lacq* remaining in the *bag*, with one *Ounce* of *Sandrac* (some add as much *Mastic* and *White-Amber*) dissolve in a large *Matras* (well stopp'd) with the *spirit* of *Wine* by at two dayes *digestion*, frequently agitating it, that it adhere not to the *Glasse* : Then *strain*, and presse it forth into a lesser *Vessel*; Some, after the first *Infusion* upon the *Ashes*, after twenty four hours, augment the *heat*, and transfer the *Matras* to the *Sand-bath*, till the *Liquor* begins to *simper*; and when the upper part of the *Matras* grows a little *hot*, and that the *Gum-lacq* is melted, which by that time (if the *Operation* be heeded) commonly it is, strain it through a *Linnen-cloth*, and presse it 'twixt two *sticks* into the *glass*, to be kept for use, which it will eternally be, if well stopp'd.

The Application.

The *Wood* which you would *Vernish*, should be very clean, smooth, and without the least *freckle* or *flaw*; and in case there be any, stop them with a *past* made of *Gum Tragacanth*, incorporated with what *Colour* you design : Then cover it with a *layer* of *Vernish* purely, till it be sufficiently drench'd with it : Then take *seven* times the quantity of the *Vernish*, as you do of *Colour*, and bruise it in a small earthen dish glaz'd, with a piece of some hard *wood*, till they are well mingled : Apply this with a very fine and full *Pencil*; a quarter of an hour after, do it over again, even to three times successively; and if every time it be permitted to *dry*, before you put on the next, 'twill prove the better : Within two hours after these four *layers* (or sooner if you please) *Polish* it with *Presle* (which our *Cabinet-makers* call as I think, *Dutch-Reeds*) wet, or dry; nor much imports it, though in doing this, you should chance to discover any of the *wood*; since you are to passe it over four or five times as above; and if it be not yet smooth enough, *Presle* it again with the *Reeds*; but now very tenderly : Then rub it

it sufficiently with *Tripoly*, and a little *Oyl-Olive*, or *Water* : Last-ly, cover it once or twice again with your *Vernish*, and two days after, polish it as before with *Tripoly*, and a piece of *Hatters Felt*.

The Colours.

To make it of a fair *Red*, Take *Spanish Vermilion*, with a quarter part of *Venice-Lacke*.

For *Black*, *Ivory* calcin'd (as *Chymists* speak) 'twixt two well luted *Crucibles*, which being grown'd in *water*, with the best and greenest *Coppors*, and so let dry, reserve.

For *Blew*, take *Ultra-Marin*, and onely twice as much *Vernish*, as of *Colour*. The rest, are to be appli'd like the *Red*, except it be the *Green*, which is hard to make fair and vivid, and therefore feldome used.

Note, The right *Japon*, is done with three or four *Layers* of *Vernish* with the *Colours*; then two of pure *Vernish un-colour'd* (which is made by the former *Processe*, without the *Sandrac* which is on-ly mingled and used for *Reds*) which must be done with a swift, and even stroke, that it may not dry before the *Aventurin* be seift-
ed on it; and then you are to cover it with so many *Layers* of pure *Vernish*, as will render it like polish'd *Glasse*. Last of all fourbish it with *Tripoly*, *Oyl*, and the *Felt*, as before directed. *Note*,

By *Venturine* is meant the most delicate and slender *Golden-wyre* such as *Embroiderers* use, reduc'd to a kind of powder, as small as you can clipp it: this strew'd upon the first *Layer* of pure *Vernish*, when dry, superinduce what *Colour* you please; and this is pretily imitated with several *Talkes*.

This being the first time that so rare a *Secret* has been imparted; the *Reader* will believe that I envy him nothing vvhich may be of use to the *Publique*: And though many years since vve vvere *Master* of this *Curiosity*, *Athanasius Kercher* has set down a *Processe* in his late *China Illustrata* pretty faithfully; yet, besides that it onely speaks *Latine* (such as 'tis) it is nothing so perfect as ours. Howbeit, there vve learn, that the most opulent *Province* of *Che-kiang* is for nothing more celebrated, than the excellent *Paper* vvhich it produces, and the *Gumme* call'd *Cie* (extilling from certain *Trees*) vvhich they compose their famous *Vernish*, so universally valu'd over the *World*; because it is found above all other *Inventions* of that nature, to preserve, and beautifie wood, above any thing vvhich has hitherto been detected: And it has accordingly so generally obtained vwith them, that they have vvhole *Rooms* and ample *Chambers*, Wainscotted therevwith, and divers of their most precious *Furniture*; as *Cabinets*, *Tables*, *Stools*, *Beds*, *Dishes*, *Skreens*, *Staves*, *Frames*, *Pots*, and other *Utensils*: But long it vvas ere vve could for all this, approach it in *Europe* to any purpose, till *F. Eustachius Imart* an *Augustine-Monk*, obtain'd the *Secret*, and oblig'd us vwith it.

I know not whether it may be any Service to speak here of *Colour'd Woods*, I mean such as are naturally so, because besides the *Berberis* for *Yellow*, and *Holly* for *White*, we have very few: Our *Inlayers* use *Fustic*, *Locust*, or *Acacia*; *Brasile*, *Prince* and *Rose-wood* for *Yellow* and *Reds*, with several others brought from both the *Indies*; but when they would imitate the naturall turning of *Leaves* in their curious *Compartiments* and *bordures* of *Flower-work*, they effect it by dipping the pieces (first cut into shape and ready to *In-lay*) so far into *hot Sand*, as they would have the *Shadow*, and the heat of the *Sand* darkens it so gradually, without detriment or burning the thin *Chip*, as one would conceive it to be natural: Note, that the *Sand* is to be heated in some very thin *Brasse* pan like to the bottom of a *Scale* or *Balance*: This I mention because the burning with *Irons*, or *Aqua-fortis*, is not comparable to it.

I learn also, that *soft Woods* attain little politure without infinite labour, and the expedient is, to *Plane* it often, and every time you do so, to smeare it with strong *Glew*, which easily penetrating, hardens it; and the frequenter you do this, and still *Plane* it, the harder, and sleeker it will remain.

And now we have spoken of *Glew*, 'tis so common and cheap, that I need not tell you it is made by boyling the *sinues*, &c. of *Sheeps-trotters*, parings of *raw Hides*, &c. to a *Gelly*, and straining it: But the finer, and more delicate Work is best fastned with *Fish Glew*, to be had of the *Droughst* by the name of *Ichthyocola*; and here I conclude.

36. Let us now then sum up all the good *qualities*, and *transcendent* perfections of *Trees*, in the harmonious *Poets*, Consort of *Elogies*.

— Pines are for *Masts* an useful Wood,
Cedar and *Cypresse*, to build *Houfes* good:
Hence covers for their *Carts*, and *spokes* for *Wheels*
Swains make, and *Ships* do form their crooked *Keels*:
The *Twiggy Sallows*, *Elms* with leaves are frail;
Myrtles stout *Spears*, and *Cornel* good for fight:
The *News* into *Ityrean Bows* are bent;
Smooth Limes, and *Box*, the *Turners* Instrument
Shaves into form, and hollow *Cups* does trim;
And down the rapid *Pe* light *Alders* swim:
In hollow *Bark* *Bees* do their hony live,
And make the *Trunk* of an old *Oak* their *Hive*.

— dant utile lignum
Navigis *Pinos*, domibus cedrosque cupressosque;
Hinc *radios* triu. re rotis, hinc *tympana* *plaustris*
Agricola, & *pandas* *ratibus* posuere *carinas*.
Viminibus *Salices*, *secunda* *frondibus* *Olmi*:
At *Myrtus* *validis* *hastilibus*, & *bona* *bello*
Coruus: *Ityreos* *Taxi* torquentur in *arcus*.
Nec *Tilia* *leues*, aut *torno* *rosile* *Buxum*,
Non *formam* accipiunt *ferroque* *cavantur* *acuto*:
Nec non *torrentem* *undam* *levis* *innatat* *Alnus*
Missa *Pado*, nec non & *apes* *examina* *condunt*
Corricibusque *cavis*, *visisque* *Illic* *alvo*:
Georg. 2.

and the most ingenious *Ovid*, where he introduces the miraculous *Grove* rais'd by the melodious *Song* of *Orpheus*,

— Nor *Trees* of *chaony*,
The *Poplar*, various *Oaks* that pierce the sky,
Soft *Linden*, smooth-rind *Beech*, unmarried *Bays*,
The brittle *Hazel*, *Ash*, whose spears we praise,
Unknotty *Fir*, the solace shading *Planes*,
Rough *Chestnuts*, *Maple* *Fleet* with different granes,
Stream-bordering *Willow*, *Lotos* loving takes,
Tuffe *Box*, whom never sappy spring forsakes,

— non *chaonis* *absuit* *arbor*.
Non *nemus* *Heliadum*, non *frondibus* *asculus* *altis*,
Nec *Tilia* *mollis*, nec *Fagus*, & *innuba* *Laurus*,
Et *Coryli* *fragiles*, & *Fraxinus* *utilis* *hastis*;
Enodisque *Abies*, *curvataque* *glandibus* *Ilex*,
Et *Platanus* *genialis*, *Acerque* *coloribus* *impar*.
Ammicolaque *simul* *Salices*, & *aquatica* *Lotos*,
Perpetuque *virens* *Buxus*, *tenueque* *Myrica*,
The

The slender *Tamarisk*, with Trees that bear
A purple Fig, nor *Myrtles* absent were.
The wanton *Ivie* wreath'd in amorous twines,
Vines bearing grapes, and *Elms* supporting *Vines*,
Straight *Service-Trees*, Trees dropping *Pitch*, fruit-red
Arbutus, these the rest accompanied.
With limber *Palms*, of Victory the prize:
And upright *Pine*, whose leaves like bristles rise,
Priz'd by the Mother of the Gods. —

Et bicolor Myrtus, & baccis cæcula Ficus.
Vos quoque flexi-pedes Hedera venistis, & una
Pampinea Vites, & amicta Vitibus Ulmi,
Ornique, & Picea, Pomoque onerata rubenti
Arbutus, & lenta victoris præmia Palma.
Et succineta comas, hirsutæque vertice Pinus
Grata Deum matri, &c. —

Sandys.

Mt. 10;

as the incomparable *Poet* goes on, and is imitated by our divine
Spencer, where he brings his gentle *Knight* into a shady *Grove*,
praising

—— the *Trees* so straight, and high,
The sailing *Pine*, the *Cedar* proud, and tall,
The Vine-prop *Elm*, the *Poplar* never dry,
The builder *Oak*, sole King of *Forests* all;
The *Aspine*, good for Staves; the *Cypress* funeral;
The *Laurel*, meede of mighty Conquerours
And Poets sage; The *Fir* that weepeth still;
The *Willow*, worn of forlorn Paramours;
The *Engb*, obedient to the benders will;
The *Birch* for Shafts; the *Sallow* for the Mill;
The *Myrrhe* sweet bleeding in the bitter wound;
The War-like *Beech*; the *Asb* for nothing ill;
The fruitful *Olive*; and the *Platane* round;
The Carver *Holm*; the *Maple*, seldom inward sound.

Canto. I.

And in this *Symphony* might the noble *Tasso* bear likewise his part;
but that these are sufficient, & tria sunt omnia.

37. For we have already spoken of that modern *Art* of *Tapping*
Trees in the *Spring*, by which doubtless some excellent and *Speci-*
fic Medicines may be attained; as from the *Birch* for the *Stone*;
from *Elms* and *Elder* against *Feavers*; so from the *Vine*, the *Oak*,
and even the very *Bramble*, &c. besides the wholesom and plea-
sant *Drinks*, *Spirits*, &c. that may possibly be educed out of them
all, which we leave to the *Industrious*, satisfying our selves, that
we have been among the first who have hinted, and Publish'd the
ways of performing it.

What now remains concerns onely some general *Precepts*, and
Directions applicable to most of that we have formerly touch-
ed; together with a *Brief* of what farther *Laws* have been enact-
ed for the *Improvement*, and preservation of *Woods*; and which
having dispatch'd, shall with a short *Paranesis* touching the pre-
sent ordering, and disposing of his *Majesties Plantations* for the
future benefit of the *Nation*, put an end to this rustick Discourse.

CHAP. XXXII.

Aphorisms, or certain general Precepts of use to the foregoing Chapters.

1. **T**Ry all sorts of *Seeds*, and by their *thriving* you shall best discern what are the most proper *kinds* for Grounds,

Quippe solo natura subest——

and of these design the main of your *Plantation*.

2. Keep your newly sown *seeds* continually fresh, and in the *shade* (as much as may be) till they peep.

3. All *curious* *Seeds*, and *Plants* are diligently to be *weeded*, till they are strong enough to over-drop or suppress them: And you shall carefully *haw*, *half-dig*, and stir up the earth about their *Roots* during the first *three* years; especially, in the *Vernal*, and *Autumnal Equinoxes*: This work to be done in a *moist* season for the first year to prevent the *dust*, and the suffocating of the tender *buds*; but afterwards, in the more dry weather.

4. *Plants*, rais'd from *seed*, shall be *thinn'd* where they come up too *thick*; and none so fit as you thus draw to be *transplanted* into *Hedge-rows*, especially, where ground is precious.

5. In *transplanting*, omit not the placing of your *Trees* towards their accustom'd *Aspect*.

6. Remove the *softest* wood to the *moistest* grounds,

Divise arboribus partia——

7. Begin to *Transplant* *Forest-trees* when the *leaves* fall after *Michaelmasse*; you may adventure when they are *tarnish'd*, and grow *yellow*: It is lost time to commence later, and for the most part of your *Trees*, early *Transplanters* seldom repent; for sometimes a tedious band of *Frost* prevents the whole *season*, and the *baldness* of the *Tree* is a note of *deceit*; for some *Oaks*, and most *Beeches*, preserve their *dead leaves* till *new* ones push them off.

8. Set deeper in the *lighter* grounds than in the *strong*; but shallowest in *Clay*: five inches is sufficient for the *dryest*, and one or two for the *moist*, provided you establish them against *winds*.

9. Plant forth in *warm*, and *moist* seasons; the *Air* tranquil and serene; the *wind* westerly; but never whiles it actually *freezes*, *Raines*, or in *Misty* Weather; for it moulds, and infects the *Roots*.

10. What

10. What you gather, and draw out of *Woods*, plant immediately, for their *Roots* are very apt to be mortified by the *winds*, and cold air.

11. *Trees*, produc'd from *Seeds* must have the *Tap-roots* abated (the *Walnut-tree*, and some others excepted, and yet if Planted meerly for the *Fruit*, some affirm it may be adventur'd on with success) and the bruised parts cut away; but sparing the *fibrous*, for they are the principal *feeders*; and those who cense them too much, are punish'd for the mistake.

12. In *Spring*, rub off some of the *collateral Buds*, to check the exuberancy of *Sap* in the *branches*, till the *Roots* be well establish'd.

13. *Transplant* no more than you well *Fence*; for that neglected, *Tree-culture* comes to nothing: Therefore all young set *Trees* should be defended from the *winds*, and *Sun*; especially the *East*, and *North*, till their *Roots* are fixed; that is, till you perceive them shoot; and the not exactly observing of this *Article*, is cause of the perishing of the most tender *Plantations*; for it is the invasion of these two *assailants* which does more mischief to our new set, and lessie hardy *Trees*, then the most severe and durable *Frosts* of a whole *Winter*.

14. The properest *Soil*, and most natural, apply to distinct *species*, *Nec verò terra ferre omnes omnia possunt*. Yet we find by experience, that most of our *Forest-Trees* grow well enough in the *coursist* Lands; provided there be a competent depth of *mould*: For albeit most of our *wild Plants* covet to run just under the *surface*, yet where there is not sufficient depth to cool them, and entertain the *Moisture* and *Influences*, they are neither lasting, nor prosperous.

15. *Wood* well Planted, will grow in *Moorish*, *Boggy*, *Heathy*, and the *stoniest* grounds: Only the white, and blew *clay* (which is commonly the best *Pasture*) is the worst for *wood*; and such good *Timber* as we find in any of these (*Oaks* excepted) is of an excessive age, requiring thrice the time to arrive at their stature.

16. If the *season* require it, all new *Plantations* are to be plied with *waterings*, which is better pour'd into a circle at some distance from the *Roots*, which should continually be bared of *Grasse*, and if the *water* be rich, or impregnated, the *shoots* will soon discover it; for the *Liquor* being percolated through a quantity of *earth* will carry the *nitrous* virtue of the *soil* with it; by no means therefore *water* at the *stem*; because it washes the *mould* from the *Root*, comes too crude, and endangers their rotting: But,

17. For the cooling and refreshing *Tree roots*, the congeisting of *Pot-sheards*, *Flints*, or *Pibbles* near the foot of the *stem*, is preferable to all other; and so the *Poet*,

Lime-stones, or squallid Shells, that may the Rain,
Vapors, and gliding moisture entertain.

*Aut lapidem bibulum, aut squallenteis infode conchas,
Inter enim labentur aqua, tenuisque subitis
Halitus* —

Georg. 2.

But remember you *remove* them after a competent time, else the *Vermine*, *Snails*, and *Insects* which they produce and shelter, will gnaw, and greatly injure their *Bark*.

18. Young *Plants* will be strangled with *Corn*, *Oates*, *Pease*, or *Hemp*, or any rankly growing *Grain*, if a competent *circle* and distance be not left (as of near a *yard*, or so) of the *Stem*; this is a *useful* remark.

19. *Cut* no *Trees* (especially, having an eminent *Pith* in them, being *young* and *tender* too) when either *heat*, or *cold* are in extremes; nor in very *wet*, or *snowy* weather; and in this work it is profitable to discharge all *Trees* of unthriving, broken, wind-shaken *browse*, and such as our *Law* terms *Cablicia*, and to take them off to the quick,

— ne pars sincera trahatur.

And for *Ever-greens*, especially such as are *tender*, prune them not after *Planting*, till they do *Radicare*, that is, by some little fresh *shoot*, discover that they have taken.

I will Conclude with the *Technical* names, or *dissimilar* parts of *Trees*, as I find them enumerated by the *Industrious* and *Learned* Dr. Merett. *Scapus*, *Truncus*, *Cortex*, *Liber*, *Malicorium*, *Matrix*, *Medulla* & *Cor*, *Pecten*, *Circuli*, *Surculi*, *Rami*, *Sarmenta*, *Ramusculi*, *Spadix*, *Vimen*, *Virgultum* & *Cremium*, *Vitilia*, *Talea*, *Scobs*, *Termes*, *Turiones*, *Frondes*, *Cachryas* & *Nucamentum*, *Julus* & *Castulus*, *Comæ*: The Species *Frutex*, *Suffrutex*, &c. all which I leave to be put into good and proper *English*, by those who shall once oblige our *Nation* with a full, and absolutely compleat *Dictionary*, as yet a great *desiderate* amongst us.

To this I shall add, the *Time*, and *Season* of the *flourishing* of *Trees*, computing from the *entrie* of each *Month* as the *figures* denote; that is, from *March* (where the *Doſtor* begins) inclusive-ly. *March*, *Acer* 3. ((i) from *March* to *May*, viz. *one Month*; & sic de cæteris) *Populus* 2. *Quercus* 5. *Sorbus* 2. *Ulmus* 2. *April*, *Alnus* 2. *Betula* 2. *Castanea* 4. *Euonymus* 2. *Fagus* 2. *Fraxinus* 2. *Nux-Juglans* 3. *Salix* 2. *Sambucus* 2. *May*, *Cornus* 2. *Genista* 4. *Juniperus*, *Morus* 2. *Tilia* 4. *June*, *Aquifolium* 2. *July*, *Arbutus* 2. *Feb.* *Buxus* 2.

Many more usefull *Observations* are to be collected, and added to these, from the diligent experience of *Planters*.

CHAP.

CHAP. XXXIII.

*Of the Laws and Statutes for the Preservation, and
Improvement of Woods, &c.*

1. **T**Is not to be pass'd by, that the very first *Law* we find which was ever *promulg'd*, was concerning *Trees*; and that *Laws* themselves were first *Written* upon them, or *Tables* compos'd of them; and after that Establishment in *Paradise*, the next we meet withal are as Antient as *Moses*; you may find the *Statute* at large in *Dent. c. 20. v. 19, 20.* Which though they chiefly tended to *Fruit-Trees*, even in an *Enemies* Countrey, yet you will find a case of *necessity*, onely alledg'd for the *permission* to destroy any other.

2. To Summe up briefly the *Laws*, and *Civil Constitutions* of great *Antiquity*, by which *Servius* informs us 'twas no less than Capital, *alienas arbores incidere*; the *Lex Aquilia*, and those of the *xii. Tabb.* mention'd by *Paulus*, *Cajus*, *Julianus*, and others of that *Robe*, repeated divers more.

It was by those Sacred *Constitutions* provided, that none might so much as Plant *Trees* on the *Confines* of his *Neighbours* *Ground*, but he was to leave a *space* of at the least *five foot*, for the smallest *Tree*, that they might not injure him with their shadow. *Si Arbor in Vicini agrum impenderit, eam sublucato. &c.* and if for all this, any hung over farther, 'twas to be strip'd up *fifteen foot*; And this *Law* *Baldwinus*, *Olderdorpius*, and *Hotoman* recites out of *Ulpian L. 1. F. de Arb. Cadend.* where we have the *Prators Interdict* express'd, and the impendent *Wood* adjudged to appertain to him whose *field*, or *fence* was thereby damnified: Nay, the Wise *Solon* prescribed *Ordinances* for the very *distances* of *Trees*; as the divine *Plato* did against stealing of *fruit*, and violating of *Plantations*: And the interdiction *de Glande legenda* runs thus in *Ulpian*, *ATT PRÆTOR, GLANDEM, QUÆ EX ILIUS AGRO IN TVUM CADIT, QUO MINUS ILLI TERTIO QUOQUE DIE LEGERE AVFERRE LICEAT, VIM FIERI VEIO.* And yet, though by the *Prators* permission he might come every *third* day to gather it up without *Trespasse*, his *Neighbour* was to share of the *Mast* which so fell into his *Ground*; and this *Chapter* is well supplied by *Pliny l. 16. c. 5.* and *Cajus* upon the *Place*, interprets *Glandem* to signifie not the *Acorns* of the *Oak* alone, but all sorts of *fruit* whatsoever, *l. 136. F. de Verb. Signif. L. Unis ff. de Glande leg.* as by usage of the *Greeks*, amongst whom ἀκροδῦνα imports all kind of *Trees*.

Moreover, no *Trees* might be Planted neer *Publique Aqueducts*, least the *Roots* should insinuate into, and displace the *Stones*: Nor on the very margent of *Navigable Rivers*, lest the *Boats* and other *Vessels* passing to and fro, should be hindred, and therefore such impediments were call'd *Retæ*, *quia Naves retinent*, sayes the *Gloss*; and because the falling of the *leaves* corrupted the *Water*. So nor within such a distance of *High ways* (which also our own *Laws* prohibit) that they might *dry* the better, and lesse cumber the *Traveller*. *Trees* that obstructed the *Foundation* of *Houses* were to be fell'd; *Bartol. L. 1. doct. c. de Interdict. Ulp. in L. priore ff. de Arborum cadend.* *Trees* spreading their *Roots* in neighbour-ground, to be in *common*; See *Cujas* and *Paulus* in *L. Arb. ff. de Communi dividend.* where more of the *Alienation* of *Trees* fell'd, and not standing but with the *Funds*, as also of the *Use-fruit* of *Trees*, and the difference 'twixt *Arbores Grandes*, and *Cremiales* or *Cedua*, of all which *Ulpian*, *Baldus*, *Alciat*, with the *Lawes* to govern the *Conducatores* and *Subducatores*, and *Pruners*; vide *Pan. f. c. Sent. l. 5. Festus, &c.* for we passe over what concerns *Vines* and *Olive-trees*, to be found in *Cato de R. R. &c.* Nor is it here that we design to enlarge, as those who have *philologiz'd* on this occasion de *Sycophantiis*, and other curious *criticisemes*; but passe now on, and confine my self to the prudent *Sanctions* of our own *Parliaments*: for though according to the old and best Spirit of true *English*, we ought to be more powerfully led by his *Majesties* Example, than to have need of more cogent and violent *Laws*; yet that our *Discourse* may be as ample, and as little defective as we can render it, something 'tis fit should be spoken concerning such *Lawes* and *Ordinances* as have been from time to time constituted amongst us for the *Encouragement*, and *Direction* of such as do well, as for the *Animadversion* and *Punishment* of those who continue *refractory*, which I deduce in this order.

3. From the time of *Edward* the fourth, were enacted many excellent *Lawes* for the *Planting*, *securing*, *cutting*, and *ordering* of *Woods*, *Copses*, and *Under woods*, as then they took cognizance of them; together with the several *penalties* upon the *Infringers*; especially from the 25 of *Hen. 8* 17. &c. confirm'd by the 13 and 27. of *Q. Eliz. cap. 25. 19. &c.* which are diligently to be consulted, revived, put in execution, and enlarg'd where any defect is apparent; as in particular the *Act* of exempting of *Timber* of 22 years growth from *Tythe*, for a longer period, to render it compleat, and more effectual to their *Improvement*: And that *Law* repealed, by which *Willows*, *Sallows*, *Oziers*, &c. which they term *Sub-bois*, are reputed but as *Weeds*.

4. Severer *punishments* have lately been ordain'd against our *Wood-stealers*, destroyers of young *Trees*, &c. by an antient *Law* of some *Nation*, I read he forfeited his *Hand*, who beheaded a *Tree* without permission of the *Owner*; and I cannot say they are sharp ones, when I compare the severity of our *Lawes* against *Mare stealers*; nor am I by inclination the least *cruel*; but I do affirm, we might
as

as well live without *Mares*, as without *Masts* and *Ships*, which are our *wooden*, but no lesse profitable *Horses*.

5. And here we cannot but perstringe those *Royotous* Assemblies of *Idle People*, who under pretence of going a *Maying* (as they term it) do oftentimes cut down, and carry away fine straight *Trees*, to set up before some *Ale-house*, or *Revelling-place*, where they keep their drunken *Bacchanalias*: For though this *Custom* was, I read, introduced by the *Emperor Anastasius*, to abolish the *Gentil Majana* of the *Romans* at *Ostia*; which was to transfer a great *Oaken-Tree* out of some *Forest* into the *Town*, and erect it before their *Mistress's* Door; yet I think it were better to be quite abolish'd amongst us, for many *reasons*, besides that of occasioning so much *wast* and *spoyl* as we find is done to *Trees* at that *Season*, under this wanton pretence, by *breaking*, *mangling*, and *tearing* down of *branches*, and intire *Arms* of *Trees*, to adorn their *Wooden-Idol*. The *Imperial Law* against such disorders we have in *L. ob. id. fl. ad legem Aquill. & in fl. l. 47. Tit. 7. Arborem furtim casarum*: See also *Triphon. L. ig. de Bon. off. cont. tab. vel in ligna focaria. L. Ligni ff. de Lege 3. &c.*

To these I might add the *Laws* of our King *Inas* or as the Learned *Lambert* calls them, *Arxamula de priscis Anglorum legibus*; whose Title is, *Be pupu barnete*: of *Burning Trees*: The *Sanction* runs thus.

If any one set fire of a fell'd Wood, he shall be punished, and besides pay three pounds, and for those who clandestinely cut Wood (of which the very sound of the Axe shall be sufficient Conviction) for every Tree, he shall be mulcted thirty shillings. A Tree so fell'd under whose Shadow thirty Hoggs can stand, shall be mulcted at three pounds, &c.

6. I have heard, that in the great *Expedition* of 88, it was expressly enjoin'd the *Spanish* Commanders of that signal *Armada*; that if when landed they should not be able to subdue our *Nation*, and make good their *Conquest*; they should yet be sure not to leave a *Tree* standing in the *Forest* of *Dean*: It was like the *Policy* of the *Philistines*, when the poor *Israelites* went down to their *Enemies Smiths* to sharpen every man his *Tools*; for as they said, *lest the Hebrews make them Swords, or Spears*; so these, *lest the English build them Ships, and Men of War*: Whether this were so, or not; certain it is, we cannot be too *jealous* for the preservation of our *Woods*; and especially of those eminent, and, with care, inexhaustible *Magazines*: I dare not suggest the encouragement of a yet farther *restraint*, that even *Proprietors* themselves should not presume to make havock of some of their own *Woods*, to feed their *prodigality*, and heap *fuel* to their *vices*; but it is worthy of our observation, that (in that inimitable *Oration*, the second *Philippic*) *Cicero* does not so sharply reproach his great *Antagonist* for any other of his *Extravagancies* (which yet he there enumerates) as for his *wasteful* disposure of certain *Wood-lands* belonging to the *Common-wealth*, amongst his jovial *Bravo's*, and

leud Companions; *tua ista detrimenta sunt* (meaning his *Debauches*) *illa nostra*; speaking of the *Timber*.

7. But to the *Laws*: it were to be wish'd that our tender, and improvable *Woods*, should not admit of *Cattle*, by any means, till they were quite grown out of *reach*; the *Statutes* which connive at it, in favour of *Custom*, and for the satisfying of a few clamorous and rude *Commoners*, being too *indulgent*; since it is very evident, that less than a 14. or 15. years *enclosure* is, in most places, too soon; and our most *material* Trees would be of *infinite* more worth and improvement, were the *Standards* suffer'd to grow to *Timber*, and not so frequently cut, at the next *felling* of the *Wood*, as the general custom is. In 22 *Edw.* 4. the liberty arriv'd but to *seven* years after a *felling* of a *Forest* or *Purlieu*; and but *three* years before, without special *license*: This was very narrow; but let us then look on *England* as an over-grown Country.

8. *Wood* in *Parks* was afterwards to be *four* years Fenced, upon *felling*: and yearling *Colts*, and *Calves* might be put into inclosed *Woods* after two: By the 13 *Eliz.* five years, and no other *Cattle* till six, if the growth was under *fourteen* years; or until *eight*, if exceeding that age till the last *felling*: All which *Statutes* being by the *Act* of *Hen.* 8. but *temporal*, this *Parliament* of *Eliz.* thought fit to make *perpetual*.

9. Then, to prevent the destructive razing, and converting of *Woods* to *Pasture*: No *wood* of two *Acres*, and above two *furlongs* from the *Mansion House*, should be indulg'd: And the *prohibitions* are good against *Affarts* made in *forests*, &c. without *license*: The *Penalties* are indeed great; but how seldom inflicted? and what is now more easie, than *Compounding* for such a *license*?

In some parts of *Germany*, vvhhere a single *Tree* is observ'd to be extraordinary fertile, a constant, and plentiful *Mast-bearer*; there are *Laws* to prohibite their *felling* without special leave: And it was well *Enacted* amongst us, that even the *Owners* of *woods* within *Chases*, should not cut down the *Timber* without view of *Officers*; this *Act* being in *affirmance* of the *Common Law*, and not to be violated without *Prescription*: See the *Case* cited by my Lord *Cook* in his *Comment* on *Littleton. Tenure Burgage. L. 2. Sect. 170.* Or if not within *Chases*, yet where a *Common-person* had liberty of *Chase*, &c. and this would be of much benefit, had the *Regarders* perform'd their duty, as 'tis at large described in the *Writ* of the 12 *Articles*; and that the *Surcharge* of the *Forests* had been honestly inspected with the due *Perambulations*, and ancient *Metes*: Thus should the *Justices* of *Eire* dispose of no *Woods* without expresse *Commission*, and in convenient places: *Minuti blaterones quercuum, culi, & curbi*, as our *Law* terms *wind-falls*, *dotterels*, *scrags*, &c. and no others.

10. Care is likewise by our *Laws* to be taken that no unnecessary *Imbezelment* be made by pretences of *Repair* of *Paling*, *Lodges*, *Bronse* for *Deer*, &c. *Wind-falls*, *Root-falls*; dead, and *Sear-trees*,
all

all which is subject to the Inspection of the *Warders, Justices, &c.* and even trespasses done *de Viridi* on boughs of *Trees, Thickets*, and the like; which (as has been shew'd) are very great impediments to their growth and prosperity, and should be duly looked after, and punish'd; and the great neglect of *Swainmote-Courts* reformed, &c. See *Consuet. & Assis. Forest. Pannagium*, or *Pastura pecorum & de Glandibus, Fleta, &c. Manwoods Forest-laws: Cook pla. fol. 266. li. 8. fol. 138.*

11. Finally, that the exorbitance, and increase of devouring *Iron-mills* were looked into, as to their *distance*, and *number* near the *Seas*, or *Navigable Rivers*; And what if some of them were even remov'd. into another world? 'twere better to purchase all our *Iron* out of *America*, than thus to exhaust our *woods* at home, although (I doubt not) they might be so order'd, as to be rather a means of conserving them. There was a *Statute* made by *Queen Eliz.* to prohibit the converting of *Timber trees* to *Coal*, or other *Fuel* for the use of *Iron-mills*; if the *Tree* were of one foot square, and growing within fourteen Miles of the *Sea*, or the greater *Rivers, &c.* 'tis pity some of those places in *Kent, Sussex*, and *Surrey* were excepted in the *Proviso*, for the reason express'd in a *Statute* made 23 *Eliz.* by which even the employing of any *under-wood*, as well as *great Trees*, was prohibited within 22 miles of *London*, and many other *Navigable Rivers, Creeks*, and other lesser distances from some parts of *Sussex-Downs, Cinque-Ports, Havens, &c.*

There are several *Acres* of *wood-land* of no mean circuit near *Rocheſter*, in the County of *Kent*, extending as far as *Bexley*, and indeed, for many miles about *Shoters-Hill*, near the *River* of *Thames*, which, were his *Majesty* owner of, might in few years, be of an *un-valuable Improvement* and benefit, considering how apt they are to grow *Forest*; and how opportune they lye for the use of his *Royal Navy* at *Chatham*.

12. But yet to prove what it is to manage *Woods* discreetly; I read of one *Mr. Christopher Darell* a *Surrey Gentleman* of *Nudigate*, that had a particular *Indulgence* for the cutting of his *Woods* at pleasure, though a great *Iron-Master*; because he so order'd his *Woods*, that they were a means of preserving even his *Woods*; notwithstanding those unsatiable devourers: This may appear a *Paradox*, but is to be made out; and I have heard my own *Father* (whose *Estate* was none of the least wooded in *England*) affirm, that a *Forge*, and some other *Mills*, to which he furnish'd much *fuel*, were a means of maintaining, and improving his *woods*; I suppose, by increasing the *Industry* of *Planting*, and care; as what he has now left standing of his own *Planting, enclosing, and cherishing*, in the possession of my most honoured Brother, *George Evelyn* of *Votton* in the same County, does sufficiently evince; a most laudable *Monument* of his *Industry*, and rare Example, for without such an *Example*, and such an *Application*, I am no *Advocate* for *Iron-works*, but a declared denouncer: But Nature has thought

fit to produce this *wasting-Oare* more plentifully in *Wood-land*, than any other *Ground*, and to enrich our *Forests* to their own Destruction,

O Poverty, still safe ! and therefore found
Insep'rably with *Mischies* under ground !
Woods tall, and Reverend from all time appear
Invulnerable, where no *Asine* is near.

O semper bona pauperies ! O conditus alibi
Thesaurus tellure nocens ! O semper evanes,
Integra, salvaque solo non divisa Sylva !

Couleii Pl. l. 6.

for so our sweet *Poet* deplores the Fate of the *Forest* of *Dean*.

13. The same *Act* we have Confirmed, and enlarged in the Seventeenth of the said *Queen*, for the preserving of *Timber-Trees*, and the Penalties of impairing *Woods* much increased; the *Tops* and *offals* onely permitted to be made use of for this employment.

14. As to the Law of *Tythes*, I find *Timber-Trees* pay none, but others do, both for *Body*, *Branches*, *Bark*, *Fruit*, *Root*, and even the *Suckers* growing out of them; and the Tenth of the *Body* sold, or kept : And so of *WWillows*, *Sallows*, and all other *Trees* not apt for *Timber* : Also of *Sylva cadua*, as *Coppices*, and *Under-woods*, pay the tenth when ever the *Proprietor* receives his *nine* Parts. But if any of these we have named un-exempted are cut onely for *Mounds*, *Fencing*, or *Plow-boot* within the *Parish* in which they grow, or for the *Fuel* of the *Owner*, no *Tythes* are due, though the *Vicar* have the *Tyth-wood*, and the *Parson* that of the places so inclosed; nor are *Under-woods* grub'd up by the *Roots* *Tythable*, unlesse for this, and any of the former *cases* there be *Prescription*. But for *Timber-trees*, such as *Oak*, *Ash*, *Elm* (which are accounted *Timber* in all places after the first *twenty years*) also *Beech*, *Horn-beam*, *Maple*, *Aspen*, and even *Hazel* (many of which are in some *Countries* reputed *Timber*) they are not to pay *Tithes*, unlesse they are sell'd before the said age of *twenty years* from their first *Planting*. Note here,

If the *Owner* sell a *fruit-tree* (of which the *Parson* has had *tythe* that *year*) and convert the *wood* into *fuel*, the *tythe* shall cease; because he cannot receive the *tythe* of one thing twice in one year.

Beech, in *Countrys* where it abounds, is not *tythable*; because in such places 'tis not accounted *Timber*. 16 *Jac. Co. B. Pinders Case*.

Cherry-trees in *Buckinghamshire* have been adjudged *Timber*, and *Tythe-free*. *Pasch. 17 Jac. B. R.*

If a *Tree* be lop'd under *twenty years* growth, and afterwards be permitted to grow past *twenty years*, and then be lop'd again, no *tythe* is due for it, though at the first cutting it were not so.

If *wood* be cut for *hedges*, which is not *tythable*, and any be left of it un-employ'd, no *tythe* shall be paid for it.

If *wood* be cut for *Hop-poles* (where the *Parson* or *Vicar* has *tythe* *Hops*) in this case he shall not have *tythe* of *Hop-poles*.

If

If a great *wood* consist chiefly of *Under wood Tythable*, and some great *trees* of *Beech*, or the like grow disperfedly amongst them; *Tythe* is due, unlesse the *Custom* be otherwise of all both great and lesser together: And in like manner if a *wood* consist for the most part of *Timber trees*, with some small scatterings of *Under-wood* amongst them, no *Tythe* shall be paid for the *Under wood* or *Bushes*. *Trin.* 19 *Jac.* B. R. *Adjdg.* 16 *Jac.* in C. B. *Leonards case*.

No *Tythe* is to be paid of Common of *Eftovers*, or the *wood* burnt in ones *Houfe*. Now as to the manner of *Payment*.

To give the *Parson* the Tenth *Acre* of *Wood* in a *Coppice*, or the tenth *Cord* (provided they are equal) is a good payment, and setting forth of *Tythe*, especially if the *Custom* confirm it.

The *Tythe* of *Mast* of *Oak*, or *Beech*, if sold, must be answer'd by the tenth *Penny*: if eaten by *Swine*, the worth of it. And thus much we thought fit to add concerning *Predial Tythes*; who has desire to be farther informed may consult my Lord *Cook's Rep.* 11. 48, 49. 81. *Flom.* 470. *Brownlows Rep.* 1 part. 94. 2 part. 150. D. & St. 169. &c: But let us see what others do.

15. The King of *Spain* has neer *Bilbao*, sixteen times as many *Acres* of *Copse-wood* as are fit to be cut for *Coal* in one year; so that when 'tis ready to be *fell'd*, an *Officer* first marks such as are like to prove *ship-timber*, which are let stand, as so many *sacred*, and *dedicate* Trees: But by this means the *Iron works* are plentifully supplied in the same place, without at all diminishing the stock of *Timber*. Then in *Biscay* again, every *Proprietor*, and other, Plants three for one which he cuts down; and the *Law* obliging them is most severely executed. There indeed are few, or no *Copfes*; but all are *Pollards*; and the very *lopping* (I am assur'd) does furnish the *Iron works* with sufficient to support them.

16. What the practise is for the maintaining of these kind of *Plantations* in *Germany*, and *France*, has already been observ'd to this *Illustrious Society* by the Learned Dr. *Meret*; viz that the *Lords* and (for the *Crown-lands*) the *Kings Commissioners*, divide the *Woods*, and *Forests*, into eighty partitions; every year felling one of the divisions; so as no *wood* is *fell'd* in less than *four score* years: And when any one *partition* is to be cut down, the *Officer*, or *Lord* contracts with the *Buyer* that he shall at the distance of every *twenty* foot (which is somewhat neer) leave a good, fair, sound and fruitful *Oak* standing. Those of 'twixt *forty*, and *fifty* years they reckon for the *best*, and then they are to *fence* these *Trees* from all sorts of *Beasts*, and injuries, for a competent time; which being done, at the *season*, downfall the *Acorns*, which (with the *Autumnal* rains beaten into the earth) take *root*, and in a short time furnish all the *Wood* again, where they let them grow for *four*, or *five* years; and then grub up some of them for *Fuel*, or *Transplantations*, and leave the most *provable* of them, to continue for *Timber*.

17. The *French King* permits none of his *Oak woods*, though belonging (some of them) to *Mounseur* (his *Royal Brother*) in *Ap-
penage*,

penage, to be cut down; till his own *Surveyors*, and *Officers*, have first *marked* them out; nor are any *fell'd* beyond such a Circuit: Then are they sufficiently *fenc'd* by him who *buys*; and no *Cattle* whatsoever suffer'd to be put in, till the very *seedlings* (which spring up of the *Acorns*) are perfectly out of danger. But *these*, and many other wholsom *Ordinances*, especially, as they concern the *Forest of Dean*, we have comprised in the late *Statute* of the *twentieth* of his *Majesties* Reign, which I find Enacted *five years* after the first *Edition* of this *Treatise*: And these *Laws* are worthy our perusal; as also the *Statute* prescribing a *Scheme* of *Proportions* for the several scantlings of *Building-Timber* (besides what we have already touched (*chap. 31.*) which you have 19 *Car. 2.* intituled, *An Act for the Re-building of London*; to which I refer the Reader.

CHAP. XXXIV.

The Parænesis and Conclusion, containing some Encouragements and Proposals, for the Planting, and Improvement of his Majesties Forests.

1. **S**ince our *Forests* are undoubtedly the greatest *Magazines* of the *Wealth*, and *Glory* of this *Nation*; and our *Oaks* the truest *Oracles* of its *perpetuity* and *happineſſe*, as being the onely support of that *Navigation* which makes us fear'd abroad, and flourish at *Home*; it has been strangely wonder'd at by some good *Patriots*, how it comes to paſſe that many *Gentlemen* have frequently repair'd, or gain'd a sudden *Fortune*, with *Plowing* part of their *Parks*, and setting out their fat grounds to *Gard'ners*, &c. and very wild *wood-land* parcels (as may be instanc'd in several places) to dressers of *Hop-yards*, &c. whiles the *Royal portion* lyes folded up in a *Napkin*, uncultivated, and neglected; especially, those Great, and ample *Forests*; where though *plowing*, and *sowing* has been forbidden, a *Royal Command*, and *Design*, may well dispense with it, and the breaking up of those *Intervals*, advance the growth of the *Trees* to an incredible *Improvement*.

2. It is therefore insisted on, that there is not a cheaper, easier, or more prompt *expedient* to advance *Ship timber*, than to solicit, that in all his *Majesties Forests*, *Woods*, and *Parks*, the spreading *Oak*, &c. (which we have formerly described) be cherish'd, by *Plowing*, and sowing *Barley*, *Rye*, &c. (with due supply of *culture* and *Soyl*, between them) as far as may (without danger of the *Plow-share*) be broken up. But this is onely where *these Trees* are

are arriv'd to some magnitude, and stand at competent distances ; a *hundred*, or *fifty* yards (for their *Roots* derive relief far beyond the reach of any *boughs*) as do the *Walnut-trees* in *Burgundy*, which stand in their best *Plow'd lands*.

3. But, that we may particularize in his *Majesties Forests* of *Dean, Sherwood, &c.* and in some sort gratifie the *Quaries* of the Honourable, the principal *Officers* and *Commissioners* of the *Navy*, I am advis'd by such as are every way *judicious*, and of long *experience* in those parts ; that to *enclose* would be an excellent way : But it is to be consider'd, that the *People, viz. Foresters, and Bordurers*, are not generally so *civil*, and reasonable, as might be wish'd ; and therefore to design a solid *Improvement* in such places, his *Majesty* must assert his *Power*, with a firm and high *Resolution* to *reduce* these men to their due *Obedience*, and to a necessity of *submitting* to their *own*, and the *publick* utility ; though they preserv'd their *industry* this way, at a very tolerable *rate* upon that *condition*, whiles some *person* of *trust*, and integrity, did regulate, and supervise the *Mounds* and *fences*, and destine some portions frequently set apart, for the raising, and propagating of *Woods*, till the whole *Nation* were furnish'd for *posterity*.

4. And which *Work* if his *Majesty* shall resolve to accomplish ; he will leave such an everlasting *Obligation* on his *People*, and raise such a *Monument* to his *fame*, as the *Ages* for a *thousand* years to come, shall have cause to celebrate his precious *Memory*, and his *Royal Successors* to emulate his *Virtue*. For thus (besides the future expectations) it would in *present*, be no deduction from his *Majesties Treasure*, but some increase ; and fall in time to be a fair and worthy *Accession* to it ; whiles this kind of *propriety* would be the most likely expedient to *civilize* those wild and poor *Bordurer* ; and to secure the vast and spreading heart of the *Forest*, which with all this *Indulgence*, would be ample enough for a Princely *Demeasnes* : And if the difficulty be to find out who *knows*, or *acknowledges* what are the *Bordures* ; this *Article* were worthy, and becoming of as serious an *Inquisition*, as the *Legislative Power* of the whole *Nation* can contrive.

5. The Sum of all, is ; get the *Bordures* well *Tenanted*, by long *Terms*, and easie *Rents*, and this will invite and encourage *Takers* ; whilst the *middle*, most secure, and interior parts would be a *Royal portion*. Let his *Majesty* therefore admit of any willing *Adventurers* in this vast *Circle* for such *Enclosures* in the *Precincts* ; and rather of *more*, than of *few*, though an *hundred* or *two*, should joyn together for any *Enclosure* of *five hundred Acres* more, or lesse ; that *multitudes* being thus engaged, the consideration might procure, and facilitate a full *discovery* of latter *Encroachments*, and fortifie the recovery by favourable *Rents*, *Improvements*, and *Reversions* by *Copy-hold*, or what other *Tenures* and *Services* his *Majesty* shall please to accept of.

6. Now for the Planting of *Woods* in such places (which is the main Design of this whole *Treatise*) the *Hills*, and rough *Grounds*

will do well; but they are the rich fat *Vales*, and *flats* which do best deserve the charge of *walls*; such as that *spot* affords; and the *Haw-thorn* well plash'd (single or double) is a better, and more natural *fence*, than *unmorter'd walls*, could our *industry* arrive to the making of such as we have describ'd: Besides, they are lasting, and profitable; and then one might allow sufficient *Bordure* for a *Mound* of any thickness, which may be the first charge, and well supported, and rewarded by the culture of the Land thus enclosed.

7. For Example, suppose a man would take in 500 Acres of good Land, let the *Mounds* be of the wildest ground, as fittest for wood: Two *hedges* with their *Vallations*, and *Trenches* will be requisite in all the Round; viz. one next to the *Enclosure*, the other about the *Thicket* to fence it from *Cattle*: This, between the two *hedges* (of whatsoever breadth) is fittest for *Plantation*: In these *Hedges* might be tryed the *Plantation* of *Stocks*, in the *intervals* all manner of *wood-seeds* sown (after competent *Plowings*) as *Acorns*, *Mast*, *Fir*, *Pine*, *Nuts*, &c. the first year chasing away the *Birds*, because of the *Fir* and *Pine* Seeds, for reasons given: the second year loosning the ground, and thinning the supernumeraries, &c. this is the most frugal way: Or by another *Method*, the waste places of *Forests* and *Woods* (which by through experience is known and tried) might be perfectly clesed; and then allowing two or three *Plowings*, well rooted *stocks* be set, cut and trimm'd as is requisite; and that the *Timber-trees* may be excellent, those afterwards *Copied*, and the choicest *stocks* kept shreaded. If an *Enclosure* be sow'd, the *Seeds* may be (as was directed) of all the *species*, not forgetting the best *Pines*, *Fir*, &c. whiles the yearly removal of very incumbrances onely, will repay the *Workmen*, who sell the *Quick*, or reserve it to store other *Enclosures*, and soften the circumjacent grounds, to the very great improvement of what remains.

8. And how if in such *fencing-works*, we did sometimes imitate what *Quintus Curtius*, lib. 6. has Recorded of the *Mardorum gens*, near to the *Confines* of *Hyrcania*, who did by the close *Planting* of *Trees* alone upon the *Bordures*, give so strange a check to the Power of that great Conqueror *Alexander*? They were a barbarous People indeed, but in this worthy our imitation; and the Work so handsomly, and particularly describ'd, that I shall not grieve to recite it. *Arbores dense sunt de industria confite, quarum teneros adhuc ramos manu flectunt, quos intortos rursus inserunt terra: Inde, velut ex alia radice, latiores virent trunci: hos, qua natura fert, adollescere non sinunt: quippe alium alii, quasi nexu conserunt: qui ubi multa fronde vestiti sunt, operiunt terram. Itaque occulti ramorum velut laquei perpetuâ sepe iter claudunt, &c.* The *Trees* (saith he) were *Planted* so near and thick together of purpose, that when the boughs were yet young and flexible, bent, and wreath'd within one another, their *Tops* were bowed into the earth (as we submerge our *Layers*) whence taking fresh roots, they shot up new stems, which not being permitted to grow as of themselves

selves they would have done, they so knit, and perplex'd one within another, that vvhen they vvere clad vvith leaves, they even cover'd the ground, and enclosed the whole Country with a kind of living net, and impenetrable hedge, as the *Historian* continues the description; and this is not unlike what I am told is frequently *practis'd* in divers places of *Devon*; where the *Oaks* being planted very neer the foot of those high *Mounds* by which they separate their *Lands*; so *Root* themselves into the *Bank*, that when it fails and crumbles down, the *Fence* continues still maintain'd by them with exceeding profit. Such works as these would become a *Cato*, or *Varro* indeed, one that were *Pater Patriæ*, *non sibi soli natus*, born for Posterity; but we are commonly of another mould,

— & *fruges consumere nati.*

9. A fair advance for speedy growth, and noble *Trees* (especially for *Walks* and *Avenues*) may be assuredly expected from the *Grafting* of young *Oaks*, and *Elms* with the best of their kinds; and where the goodliest of these *last* are growing, the ground would be *plow'd*, and finely *raked* in the season when the *Scales* fall; that the showres and dews fastning the *Seed* where the wind drives it, it may take *Root*, and hasten (as it will) to a sudden *Tree*; especially, if seasonable *shreading* be appli'd, which has sometimes made them arrive to the height of *Twelve* foot by the first *three* years, after vvhich they grovv again. And if such vvere planted as *near* to one another as in the *Examples* vve have alledg'd, it is almost incredible, vvhat a *paling* they vvould be to our most expos'd *Plantations*, mounting up their vvooden *walls* to the clouds: And indeed the shelving, and natural declivity of the *Ground* more or lesse to our unkind *Aspects*, and bleak *Winds*, does best direct to the *thickning* of these protections; and the benefit of *that*, soon appear, and recompence our industry in the smoothness and integrity of the *Plantations* so defended.

10. That great care be had of the *Seeds* vvhich vve intend to sovv has been already advis'd; for it has been seen, that *Woods* of the same *age*; planted in the same *soil*, discover a visible difference in the *Timber* and *growth*; and vvhere this variety should happen, if not from the *seed*, vvill be hard to interpret; therefore, let the *place*, *soil* and *growth* of such *Trees* from vvhence you have your *seeds*, be diligently examin'd; and vvhy not this, as vvell as in our care of *Animals* for our breed and store?

11. As to the *Form*, obey the natural *site*, and submit to the several guizes; but ever declining to enclose *High wayes*, and *Common-Roads* as much as possible. For the rest, be pleas'd to reflect on what we have already said, to encourage the *Planting* of the large spreading *Oak* above all that *species*; the amplitude of the *distance* which they require resign'd to the care of the *Verderer* for grazing *Cattle*, *Deer*, &c. and for the great and *masculine* beauty which a wild *Quincunx*, as it were, of such *Trees* would present to your eye.

12. But to advance his *Majesties Forests* to this height of perfection, I should again urge the removal of some of our most mischievously plac'd *Iron-mills*; if that at least be true which some have affirm'd, that we had better *Iron*, and cheaper from *Forreigners*, when those *works* were strangers amongst us. I am inform'd, that the *New-English* (vvho are novv become very numerous, and hindred in their advance and prospect of the *Continent* by their surfeit of the *Woods* which we want) did about *twelve* years since, begin to clear their *High ways* by two *Iron-mills*: I am sure their zeal has sufficiently wasted our stately *Woods*, and *Steel* in the bowels of their *Mother old England*; and 'twere now but expedient, their *Brethren* should hasten thither to supply us with *Iron* for the peace of our dayes; whilst his *Majesty* becomes the great *Sovereign* of the *Ocean*, free *Commerce*, *Nemorum Vindex & Instaurator magnus*. This were the onely way to render both our *Countries habitable* indeed, and the fittest *Sacrifice* for the *Royal Oaks*, and their *Hamadryad's* to whom they owe more than a sleight submission: And he that should deeply consider the prodigious waste which these voracious *Iron*, and *Glasse-works* have formerly made but in one *County* alone, the *County of Sussex*, for *120 Miles* in length, and *thirty* in breadth (for so wide, and spacious was the antient *Andradswald*, of old one intire *Wood*, but of which there remains now little, or no sign) would be touch'd with no mean *Indignation*: Certainly, the goodly *Rivers* and *Forests* of the other *World*, would much better become our *Iron*, and *Saw-mills*, than these exhausted *Countreys*; and we prove gainers by the timely removal: I have said this already, and I cannot too often inculcate it for the Concerns of a *Nation*, whose onely Protection (under *God*) are her *Wooden Walls*.

13. Another thing to be recommended (and which would prove no lesse than *thirty* years, in some places *forty*, and generally *twenty* years advance) were a good (if well executed) *Act* to save our *Standards*, and borduring *Trees* from the *Ax* of the Neighbourhood: And who would not preserve *Timber*, when within so few years the *price* is almost quadrupl'd? I assure you *standards* of *twenty*, *thirty*, or *forty* years growth, are of a long day for the Concernments of a *Nation*.

14. And though we have in our general *Chapter* of *Coppes*, declar'd what by our *Laws*, and common *usage* is expected at every *Fell* (and which is indeed most requisite, till our store be otherwise suppli'd) yet might much even of that rigor be abated, by no unfrugal permissions to take down more of the *Standards* for the benefit of the *Under-woods* (especially where, by over-dropping, and shade they interrupt the kindly *Dews*, *Rains*, and *Influences* which nourish them) provided that there were a proportionable number of *Timber-trees* duly, and thoroughly Planted, and preserved in the *Hedge-rows* and *Bordures* of our grounds; in which case, even the total clearing of some *Coppes* would be to their great advance, as by sad experience has been taught some good *Husbands*,

bands, whose necessities sometimes forced them to violate their *Standards*, and more grown *Trees* during the late *Tyranny*.

15. Nor will it be here unseasonable to advise, that where *Trees* are manifestly perceiv'd to *decay*, they be marked out for the *Ax*, that so the *younger* may come on for a supply; especially, where they are chiefly *Elms*; because their *successors* hasten to their height and perfection in a competent time; but beginning once to grow sick of *Age*, or other infirmity, suddenly impair, and lose much of their value yearly: besides, that the increase of *this*, and other speedy *Timber*, would spare the more *Oak* for *Navigation*, and the sturdier uses.

How goodly a sight were it, if most of the *Demefnes* of our *Country Gentlemen* were crown'd and incircl'd with such stately rows of *Limes*, *Firs*, *Elms*, and other ample, shady and venerable *Trees* as adorn *New-Hall* in *Essex*, the Seat of that *Suffolk Knight* near *Tarmouth*, and our neighbouring Pastures at *Barnes*? Yet were these Plantations but of late years in comparison: It were a noble, and immortal *providence* to imitate these good *Husbands* in larger, and more august *Plantations* of such useful *Trees*, for *Timber* and *Fuel*, as well as for *Shade*, and *Ornament* to our *Dwellings*.

16. But these incomparable undertakings will best of all become the *Inspection* and care of the Honourable *Lieutenants*, and *Rangers*, when they delight themselves as much in the goodlineffe of their *Trees*, as other men generally do in their *Dogs*, and *Horses*, for *Races*, and *Hunting*; neither of which *Recreations* is comparable to that of *Planting*, either for *Virtue*, or *Pleasure*, were things justly consider'd according to their true estimation: Not yet that I am of so morose an *humour*, that I reprove any of those noble, and manly *Diversions*, seasonably us'd; but because I would court the *Industry* of great and opulent *persons*, to *profitable*, and permanent *delights*: For, suppose that *Ambition* were chang'd into a laudable *emulation*, who should best, and with most artifice, raise a *Plantation* of *Trees*, that should have all the proper *Ornaments*, and *perfections* their nature is susceptible of, by their direction and encouragement; such as *Ælian* sums up lib. 3. c. 14. *ἐν αὐτῇ οἱ κλάδοι, καὶ ἡ κορυφή, &c.* kind, and gentle *Limbs*, plenty of large *leaves*, an ample, and fair *body*, profound, or spreading *Roots*, strong against impetuous *Winds* (for so I affect to read it) extensive, and venerable *Shade*, and the like: Methinks there were as much a subject of *Glory* as could be phancied of the kind; and comparable, I durst pronounce, *preferrable*, to any of their *Recreations*; and how goodly an *Ornament* to their *Demefnes* and *Dwellings*, let their own eyes be the judges.

17. One *Encouragement* more, I would reinforce from an *History* I have read of a certain frugal, and most *Industrious Italian Noble-man*, who, after his *Lady* was brought to Bed of a *Daughter*, considering that *Wood* and *Timber* was a *Revenue* coming on whilst the *Owners* were asleep: commanded his *Servants* immediately to
Plant

Plant in his *Lands* (which were ample) *Oaks*, *Asbes*, and other profitable, and *Marketable Trees*, to the number of an *Hundred thousand*; as undoubtedly calculating, that *each* of those *Trees*, might be worth *twenty pence*, before his *Daughter* became *Marriageable*, which would amount to 100000 *francs* (which is near *ten thousand pounds sterling*) intended to be given with his *Daughter* for a *Portion*. This was good *Philosophy*, and such as I am assur'd is frequently practis'd in *Flanders* upon the very same account: Let us see it once take effect amongst our many slothful *Gentry*, who have certainly as large *Demesnes*, and yet are so deficient in that decent point of *timely* providing for their numerous *Children*: And those who have *none*, let them the rather *Plant*: *Trees* and *Vegetables* have *perpetuated* some *Names* longer, and better than a *Pedigree* of a numerous *Off-spring*; and it were a pledge of a *Noble Mind*, to oblige the future *Age* by our particular *Industry*, and by a long lasting train, with the *living work* of our *own hands*: But I now proceed to more general *Concerns*, in order to the *Quaries*, and first to the *proportion*.

18. It were but just, and infinitely befitting the miserable *needs* of the whole *Nation*, that every *twenty Acres* of *Pasture*, made an allowance for *half* an *Acre* of *Timber*, the *Ground* dug about *Christmas*, casting the *Grassy side* downwards till *June*, then dug again, and about *November* stir'd afresh, and sown with *Maiz*, or planted in a *clump*, well preserv'd, and fenc'd for 14, or 15 years; unless that *Sheep* might haply *Graze* after 4 or 5 years: And where the young *Trees* stand too thick, there to *draw*, and *transplant* them in the *Hedge-rows*, which would also prove excellent shelter for the *Cattel*: This *Husbandry* would more especially become *Northamptonshire*, *Lincolnshire*, *Cornwall*, and such other of our *Countries* as are the most naked of *Timber*, *Fuel*, &c. and unprovided of covert: For it is rightly observ'd, that the most fruitfull places, least abound in *wood*, and do most stand in need of it.

19. Such as are ready to tell ye their *Lands* are so wet, that their *Woods* do not thrive in them; let them be converted to *Pasture*; or bestow the same industry on them which good *husbands* do in *Meadows* by *draining*: It is a sloathfullness unpardonable; as if the *pains* would not be as fully recompenc'd in the growth of their *Timber*, as in that of their *grass*: Where poor hungry *Woods* grow, rich *Corn*, and good *Cattle* would be more plentifully bred; and it were beneficial to convert some *Wood-land* (where the proper vertue is exhausted) to *Pasture* and *Tillage*; provided, that fresh *Land* were improved also to *wood* in recompence, and to balance the other.

20. Where we find *uliginous* and starv'd places (which sometimes obey no Art or Industry to *drain*, and of which our pale and fading *Corn* is a sure indication) we are as it were courted to obey *Nature*, and improve them for the propagation of *Sallies*, *Willows*, *Alders*, *Abele*, *Sycamore*, *Aspine*, *Birch*, and the like hasty and profitable growers, by ranging them, casting of *Ditches*, *Trenches*, &c. as before has been taught.

21. In

21. In the mean while, 'tis a thing to be deplor'd, that some persons bestow more in *grubbing*, and dressing a few *Acres* which has been excellent *wood*, to convert it into wretched *pasture*, not worth a quarter of what the *Trees* would have yielded, well order'd, and left standing; since it is certain, that *barren land* planted with *wood*, will *trebble* the *expence* in a short time. Of this, the R. Honourable the L. Vicount Scudamor may give fair proof, who having fell'd (as I am credibly inform'd) a decay'd *Wood*, intended to be set to *Tennants*; but upon second thoughts (and for that his Lordship saw it apt to cast *Wood*) enclos'd and preserv'd; it yielded him, before thirty years were expir'd, neer 1000 pound upon *Wood-Falls*, whereas the utmost *Rent* of the whole price of *Land* yearly, was not above 8 pound 10 shillings. The like I am able to confirm by instancing a noble Person, who (a little before our unhappy Wars) having sown three or four *Acres* with *Acorns*, the fourth year *transplanted* them which grew too thick all about his Lordship: These *Trees* are now of that *stature*, and so likely to prove excellent *Timber*, that they are already judg'd to be almost as much worth as the whole *Demesnes*; and yet they take off nothing from other *profits*, having been discreetly dispos'd of at the first *designment*. And supposing the *Longuevity* of *Trees* should not extend to the *Periods* we have (upon so good account) produc'd; Yet, neither is their arrival to a very competent *perfection*, so very *discouraging*; since I am credibly inform'd, that several Persons have built of *Timber* (and that of *Oak*) which were *Acorns* within this *fourty years*; and I find it credibly reported, that even our famous *Forest* of *Dean*, hath been utterly *wasted* no less than *three* several times, within the space of *Nine-hundred years*. The Prince Elector Frederic IV, in the year 1606. sow'd a part of that most barren *Heath* of *Lambertheim*, with *Acorns* after *plowing*, as I have been inform'd; it is now likely to prove a most goodly *Forest*, though all this while miserably neglected by reason of the Wars. For the care of *Planting Trees*, should indeed be recommended to *Princes* and great Persons, who have the *Fee* of the *Estate*; *Tennants* upon the *Rack* by reason of the tedious expectation, and jealousy of having their *Lands* enhanc'd, are for the most part averse from this *Husbandry*; so that unless the *Land-Lord* will be at the whole *Charge* of *Planting*, and *Fencing* (without which as good no *Planting*) little is to be expected; and whatsoever is propos'd to them above their usual course, is look'd upon as the *whim* and fancy of *speculative* Persons, which they turn into *ridicule* when they are applied to *Action*; and this, says an ingenious and excellent *Husband* (whose *Observations* have afforded me no little treasure) might be the reason, why the prime *Writers* of all *Ages*, endeavour'd to involve their *Discourses* with *Allegories*, and *Enigmatical* termes, to protect them from the contempt, and pollution of the *Vulgar*, which has been of some ill Consequence in *Husbandry*; for that very few *Writers* of *Worth*, have adventured upon so plain a *Subject*, though doubtlesse to any *Considering Person*,
the

the most *Delightful* kind of *Natural Philosophy*, and that which employs the most useful part of the *Mathematics*.

The Right Honourable my Lord *Viscount Mountague* has Planted many thousands of *Oaks*, which I am told, he draws out of *Copses*, big enough to defend themselves; and that with such success, as has exceedingly improv'd his *Possessions*; and it is a worthy *Example*. To conclude, I can shew an *Avenue* Planted to a House standing in a barren *Park*, the Soil a cold *Clay*; it consists totally of *Oaks*, one hundred in number: The person who first set them (dying very lately) lived to see them spread their *branches* 123 foot in compass, which at distance of 24 foot, mingling their shady *treffes* for above 1000 in length, form themselves into one of the most venerable, and stately *Arbor Walks*, that in my life I ever beheld: This is at *Baynards* in *Surrey*, and belonging to my most honour'd Brother (because a most industrious Planter of Wood) *Richard Evelyn Esq*; The Walk is broad 56 foot, and one Tree with another containing by estimation *three quarters* of a load of *Timber* in each Tree, and in their *tops* three Cord of fire-wood: Their *Bodies* are not of the tallest, having been topped when they were young, to reduce them to an uniform height; yet is the *Timber* most excellent for its scantling, and for their *heads*, few in *England* excelling them: where some of their contemporaries were planted single in the *Park* without cumber, they spread above *four score* foot in *arms*.

22. I have produced these *Examples*, because they are *conspicuous*, full of *encouragement*, worthy our *imitation*; and that from these, and sundry others which I might enumerate, we have made this Observation, that almost any *Soil* is proper for some profitable *Timber-Trees* or other, which is good for very little else.

23. The bottoms of *Downs*, and like places well *Plow'd*, and *sown* will bear lusty *Timber*, being broken up, and let lye till *Midsummer*, and then stir'd again before sowing about *November*.

An old, and judicious Planter of *Woods*, prescribes us these *Directions*, for improving of *Sheep-walks*, *Downs*, *Heaths*, &c. Suppose, on every such *Walk* on which 500 *Sheep* might be kept, there were *Plow'd* up twenty *Acres* (*Plow'd* pretty deep, that the *Roots* might take hold, and be able to resist the *Winds*) this should be sowed with *Mast* of *Oak*, *Beech*, *Chats* of *Ash*, *Maple-keys*, *Sloes*, *Service-berries*, *Nuts*, *Bullis*, &c. bruised *Crabs*, and *Haws*; mingled and scatter'd about the sides and ends of the *Ground*, near a *yard* in breadth. On the rest sowe no *Haws*, but some few *Crab-kernells*: Then begin at a *side*, and sowe five *yards* broad, *Plowing* under the *Mast*, &c. very shallow; then leave six *yards* in breadth, and sowe, and *Plow* five *yards* more, and so from side to side; remembering to leave a *yard* and *half* at the last side; let the rest of the *head-lands* lie, till the Remainder of the *Clofe* be sown in *March* with *Oates*, &c. to preserve it from hurt of *Cattel*, and potching the *Ground*, when the *Spring* is of two years growth, draw part of it for

for *Quick-fets*; and when the rest of the *Trees* are of six years *shoot*, exhaust it of more; and leave not above *forty* of either side, each row five yards distant; and *here*, and *there* a *Crab stock* to *graff* on, and in the invironing *Hedge* (to be left thick) let each *Tree* stand *four* yards asunder; which if *forty four* were spared, will amount to about 4000 *Trees*: At *twenty* years end stock up 2000 of them, lop a *thousand* more every *ten* years, and reserve the remaining *thousand* for *Timber*: Judge what this may be worth in a short time, besides the *Grass*, &c. which will grow the first six or seven years, and the benefit of shelter for *Sheep* in ill Weather, when they cannot be *folded*; and the *Pasture* which will be had under the *Trees*, now at eleven yards interval, by reason of the *stocking* up those 2000 we mention'd, excepting the *Hedges*; and if in any of these *Places* any considerable *waters* fortune to lye in their bottoms, *Fowl* would abundantly both *breed*, and *harbour* there. These are admirable *Directions* for *Park-lands* where *shelter* and *Food* is scarce.

But even this *Improvement* yet does no way reach, what I have met withal in the most accurate, and no less laborious *Calculation* of Captain *Smith* upon this very *Topic*; where he *Demonstratively* asserts, that a *thousand Acres* of *Land*, Planted at one foot interval, in 7201 rowes; taking up 51854401 *Plants* of *Oak*, *Ash*, *Chestnut* (or to be *sown*) taking up 17284800 of each sort, and fit to be *transplanted* at three years period (if set in good ground) are worth *eighteen pence* the hundred; and there being 345696 hundred, it amounts to no less than 25927*l.* 4*s.* besides the *Chestnuts*, of which there being 1728480*l.* (valued at, and worth half a *Crown* the Hundred) they come to 21606 *l.* and the total of all, to 47533*l.* 4*s.*

This being made out, consider what an immense sum, *great Trees* would amount to, and in a large quantity of *Land*; such as were worthy a *Royal* undertaking: It is computed, that at three foot distance, the first *Felling* (that is, eight, or nine years after their *Planting*) would be worth in *Hoops*, *Poles*, *Firing*, &c. 55015 *l.* and the second *Fell*, 28657 *l.* 19*s.* 5*d.* And the fourth (which may be about thirty two years from their *Semination*) 90104 *l.* 17*s.* and so forward.

At four foot interval, and *Felling*, according to the same proportion, you may likewise reckon; and in 11 years with three years *Crop* of *Wheat* (sow'd at first between) it will amount to 34001 *l.* 9*s.* 4*d.* And the next, very much more; in regard the *Wood* will spring up thicker: So as at the fifth *Fell*, the account stands 126992 *l.* 10*s.* 2*d.* &c. and at the seventh (whoever lives to it) 200000: And if planted at wider distance, *viz.* 18 foot (according to the *Captains* method) at 30, or 40 years growth you may compute them worth 192961 *l.* 6*s.* And in *seventy* years, 201001; besides the three years crop of *Wheat*, in all 410312 *l.* 16*s.* which at 36 foot interval (accounted the utmost for *Timber*) takes up (for 1000 *Acres*) 40401 *Trees* for the first 100 years. Then,

To make room, as they grow larger, grubbing up every middle Tree, at 9 *l.* per Tree, 19800 Trees amount to 99000 *l.* and the remaining 20601 at 220 years growth, at but 8 *l.* per Tree, comes to 164808 *l.* besides the inferior Crop of *Meadow*, or *Corn* in all this time, sown in the distances; reckoning for three years product 90000 *Bushels* at 5 *s.* per *Bushel*, which will amount to 22500 *l.* besides the *Straw*, *Chaff*, &c. which at 5 *s.* a *Load*, and 3 *d.* a *Bush.* *Chaff*, comes to 2025 *l.* So as the total *Improvement* (besides the 217 years emolument arising from the *Corn*, *Cattel*, &c.) amounts to 288333.

And these *Trees* (as well they may) coming to be worth for *Timber*, 20 *l.* an *Oak*; the 20601 *Trees* amount to 412020 *l.* and the total *Improvement* of the 1000 *Acres* (the *Corn* Profits not computed) ascends to 675833 *l.* So as admit there were in all *England* (and which his *Majesty* might easily compass, even for his own *Proportion*, and for *Posterity*) 20000 *Acres* thus *Planted*, at two foot diameter (and as may be presum'd thirty foot high, which in 150 years, they might well arrive to) they would be worth 13516660 *l.* an immense and stupendious *Summe*, and an everlasting supply for all the *Uses* both of *Sea* and *Land*: But it is to Captain *Smith's* laborious *Works* (to which I wish all encouragement) that we have the total *Charge* of this noble *Undertaking* from the first *Semination*, to their *maturity*; by which it will be easie to compute what the *Gains* will be for any greater or lesser quantity.

But now to return to the *Place* of *Planting* (from whence this *Calculation* has more than a little diverted) we shall find, as we said, that even in the most craggie, uneven, cold and exposed places, not fit for *Arable*, as in *Biscay*, &c. and in our very *Peaks* of *Derbyshire*, and other *Rockie* places, *Ashes* grow about every *Village*, and we find that *Oak*, *Beech*, *Elm*, and *Ash*, will prosper in the most stony Soils. And it is truly from these *Indications*, more than from any other whatsoever, that a broken, and decaying *Farmer*, is to be distinguish'd from a substantial *Free-holder*, the very *Trees* speaking the conditions of the *Master*: Let not then the *Royal Patrimony* bear a *Bankrupt's* reproach: But to descend yet lower;

24. Had every *Acre* but three, or four *Trees*, and as many of *Fruit* in it as would a little adorn the *Hedge-rows*, the *Improvement* would be of fair advantage in a few years; for it is a shame that *Turnip-planters*, should demolish, and undo *hedge-rows* neer *London*, where the *Mounds* and *Fences* are stripp'd naked, to give *Sun* to a few miserable *Roots*, which would thrive altogether as well under them, being skilfully prun'd and lopp'd: Our *Gard'ners* will not believe me, but I know it to be true, though *Pliny* had not affirm'd it: As for *Elms* (saith he) their *Shade* is so gentle and benigne, that it nourishes whatsoever grows under it: And (lib 17. c. 22.) it is his opinion of all other *Trees* (very few excepted) provided their *Branches* be par'd away, which being discreetly done, improves the *Timber* as we have already shew'd.

25. Now

25. Now let us *calculate* a little at adventure, and much within what is both *faissible*, and very *possible*; and we shall find, that *four Fruit-trees* in each *Acre* throughout *England*, the product sold but at *six pence* the *Bushel* (but where do we now buy them so *cheap*?) will be worth a *Million* yearly: What then may we reasonably judge of *Timber*, admit but at the *growth* of *four pence* per *Acre* yearly (which is the lowest that can be estimated) it amounting to near *two Millions*? if (as 'tis suppos'd) there may be *five* or *six* and *twenty Millions* of *square Acres* in the *Kingdom* (besides *Fens*, *High-ways*, *Rivers*, &c. not counted) and without reckoning in the *Mast*, or *loppings*, which whosoever shall *calculate* from the annual *Revenue*, the *Mast* onely of *Westphalia*, a small and wretched Countrey in *Germany*, does yield to that *Prince*, will conclude to be no despicable *Improvement*.

26. In this poor *Territory*, every *Farmer* does by antient *custom*, Plant so many *Oaks* about his *Farm*, as may suffice to feed his *Swine*: To effect this they have been so careful, that when of late years, the *Armies* infested the poor *Countrey*, both *Imperialists*, and *Protestants*; the onely *Bishoprick* of *Munster* was able to pay *One hundred thousand Crowns per mensem* (which amounts of our money to about 25000 *l. sterling*) besides the ordinary *entertainment* of their own *Prince* and *private families*. This being incredible to be practis'd in so extream barren a *Countrey*, I thought fit to mention, either to encourage, or reproach us: *General Melander* was wont to say, The good *Husbandry* of their *Ancestors* had left them this Stock *pro sacra Anchorâ*; considering how the *People* were afterward reduc'd to live even on their *Trees*, when the *Souldiers* had devour'd their *Hogs*; redeeming themselves from great extreamities, by the *Timber* which they were at last compelled to cut down, and which, had it continu'd, would have prov'd the utter desolation of that whole *Countrey*. I have this *Instance* from my most worthy, and honourable Friend *Sir William Curtius* (his *Majesties Resident* in *Germany*) who receiv'd this particular from the mouth of *Melander* himself: In like manner, the *Princes*, and *Freedoms* of *Hesse*, *Saxony*, *Thuringia*, and divers other places there, make vast incomes of their *Forest-fruit* (besides the *Timber*) for *Swine* onely. I say then, whosoever shall duly consider this, will find *Planting* of *Wood* to be no contemptible *Addition*; besides the *Pasture* much improv'd, the *cooling* of *fat*, and heavy *Cattel*, keeping them from injurious motions, disturbance, and running as they do in *Summer* to find shelter from the *heat*, and vexation of *flies*.

27. But I have done, and it is now time for us to get out of the *Wood*, and to recommend this, and all that we have propos'd, to His most Sacred *Majesty*, the Honourable *Parliament*, and to the *Principal Officers*, and *Commissioners* of the *Royal Navy*; that where such *Improvements* may be made, it be *speedily*, and *vigorously* prosecuted; and where any *defects* appear, they may be duly reformed.

28. And what if for this purpose there were yet some additional Office Constituted, which should have a more universal *Inspection*, and the charge of all the *Woods* and *Forests* in His *Majesties Dominions*? This might easily be perform'd by *Deputies* in every *County*; Persons judicious, and skilful in *Husbandry*; and who might be repair'd to for advice and direction: And if such there are at present (as indeed our *Laws* seem to provide) that their *Power* be sufficiently amplified where any thing appears *deficient*; and as their zeal excited by worthy encouragements, so might neglects be encounter'd by a vigilant and industrious *Cheque*. It should belong to their *Province*, to see that such *Proportions* of *Timber*, &c. were *Planted*, and set out upon every hundred, or more of *Acres*, as the Honourable *Commissioners* have suggested; or, as might be thought convenient, the *quality*, and *nature* of the *places* prudently consider'd: It should be their *Office* also, to take notice of the *growth*, and *decay* of *Woods*, and of their *fitness* for publick *uses* and *sale*, and of all these to give *Advertisements*, that all defect in their ill governing may be speedily remedied; and the Superiour *Officer*, or *Surveyor*, should be accountable to the *Lord Treasurer*, and to the principal *Officers* of his *Majesties Navy* for the time being: And vvhy might not such a *Regulation* be vvorthy the establishing by some *Solemn*, and publick *Act* of *State*, becoming our glorious *Prince*, SOVEREIGN OF THE SEAS, and his prudent *Senate*, this present *Parliament*?

29. We find in *Aristotles Politics*, the Constitution of *Extraurban Magistrates* to be *Sylvarum Custodes*; and such vv ere the *Consulares Sylvæ*, vv hich the great *Cæsar* himself (even in a time vv hen *Italy* did abound in *Timber*) Instituted; and vv as one of the very first things vv hich he did, at the settling of that vast *Empire*, after the *Civil Wars* had exceedingly vv asted the Countrey: *Suetonius* relates it in the *Life* of *Julius*; and *Peter Crinitus* in his fifth Book *De honesta disciplina*, c. 2. gives this reason for it, *Ut materies* (saith he) *non deesset, qua videlicet Navigia publica possent à præfecturis fabricum, confici*: True it is, that this *Office* vv as sometimes call'd *Provincia minor*; but for the most part, annex'd, and joyn'd to some of the greatest *Consuls* themselves; that facetious *sarcasme* of the *Comædian* (vv here *Plautus* names it *Provincia caudicaria*) referring onely to some under *Officer*, subservient to the other: And such a *Charge* is at this day extant amongst the noble *Venetians*, vv ho have near *Trivisi* (besides vv hat they nourish in other places) a goodly *Forest* of *Oaks*, preserv'd as a *Jewel*, for the onely use of the *Arsenal*, call'd the *Montello*, vv hich is in length twelve *Miles*, large five, and near twenty *miles* in compasse; carefully supervised by a certain *Officer*, vv hom they name *il Capitano*; and vv e might Instance in many other prudent *States*; not to importune you vv ith the expresse *Laws* vv hich *Ancus Martius* the Nephew of *Numa*, and other *Princes* long before *Cæsar*, did ordain for this very purpose; since indeed, the care of so publick, and honourable

honourable an *Enterprize* as is this of *Planting*, and *Improving* of *Woods*, is a right noble, and *Royal undertaking*; as that of the *Forest* of *Dean*, &c. in particular (were it bravely manag'd) an *Imperial design*; and I do pronounce it more worthy of a *Prince*; who truly consults his *glory* in the highest *Interest* of his *Subjects*, than that of gaining *Battels*, or subduing a *Province*: And if in saying so, or any thing else in this rustic *Discourse*, I have us'd the freedom of a plain *Forester*; it is the *Person* you command me to put on, and my plea is ready,

Ἀρὺς παρούς, πᾶς ἀνὴρ ἐυκρίσις.

Præsentè Quercu, ligna quivis colligit.

for who could have spoken *lesse* upon so ample a *Subject*? and therefore I hope my *zeal* for it in these *Papers*, will (besides your *Injunctions*) excuse the prolixity of this *Digression*, and all other the *Imperfections* of my *Services*.

Si canimus Sylvas, Sylvæ sunt Consule dignæ.

CHAP. XXXV.

An Historical Account of the Sacredness, and Use of standing Groves, &c.

1. **A**ND thus have we finish'd what we esteem'd necessary for the Direction of *Planting*, and the *Culture* of *Trees* and *Woods* in general; whether for the raising of *new*, or preservation of the more *Antient* and venerable *shades*, crowning the brows of lofty *Hills*, or furnishing, and adorning the more fruitful and humble *Plains*; *Groves* and *Forests*, such as were never Prophan'd by the Inhumanity of *Edge-tools*: *Woods*, whose Original are as unknown as the *Arcadians*; like the goodly *Cedars* of *Libanus*, *Psal.* 104. *Arbores Dei* according to the *Hebrew*, for something doubtless which they noted in the *Genius* of those *Venerable* places besides their meer bulk and Stature: And verily, I cannot think to have well acquitted my self of this useful *Subject*, till I shall have in some sort vindicated the honour of *Trees*, and *Woods*, by shewing my *Reader* of what Estimation they were of *old* for their *Divine*, as well as *Civil Uses*; at least refresh both *Him*, and my *Self*, with what occurs of *Historical* and *Instructive* amongst the *Learned* concerning them.

2. Though

2. Though *Sylva* was the more general Name, denoting a large Tract of *Wood*, or *Trees*, the *incidua* and *cadua*; yet there were several other Titles attributed to greater or lesser assemblies of them: As when they Planted them for Pleasure, and shade onely, they had their *Nemora*; and as we our *Parks*, for the preservation of *Game*, and particularly *Venizon*, &c. their *Saltus*, and *Sylva invia*, secluded for the most part from the rest, &c. But among *Anthours*, we meet with nothing more frequent, and indeed more celebrated, than those *Arboreous* amenities and *Plantations* of *Woods*, which they call'd *Luci*; and which though sometimes we confesse, were restrain'd to certain peculiar places: Yet were they also promiscuously both used, and taken for all that the wide *Forest* comprehends, or can signifie. To dismiss a number of *Criticks*, The name *Lucus* is deriv'd by *Quintilian* and others à *minime Lucendo* because of its densitie

— *nullo penetrabilis astro.*

whence *Apuleius* us'd *Lucum sublucidum*; and the *Poets*, *Sublustris umbra*: Others (on the contrary) have taken it for *Light* in the *Masculine*; because there they kindled *Fires*, by what accident unknown

— Whether it were
By Lightning sent from Heaven, or else there
The Salvage-men in mutual Wars and Fight,
Had set the Trees on Fire, their Foes t' affright.

— *Seu Caeli fulmine misso*
Sive quod inter se bellum Sylvestria gentes
Hostibus intulerant ignem, formidinis ergo, &c.

Lucret. l. 5.

Or whether the Trees set Fire on themselves

When clashing boughs thwarting, each other fret.

Mutus dum inter serami stirpesque terantur.

For such Accidents, and even the very heat of the *Sun* alone has kindled wonderful *conflagrations*; or happily to consume their *Sacrifices*, we will not much insist: The *Poets* it seems, speaking of *Juno*, would give it quite another original, and tune it to their Songs invoking *Lucina*, whilst the main and principal difference consisted not so much in the Name, as the *Use* and *Dedication*, which was for silent, awful and more solemn *Religion*, to which purpose they were chiefly *manu confiti*, such as we have been treating of, *intire*, and never violated with the *Ax*: *Fabius* calls them *Sacros ex Vetustate* venerable for their *Age*; and certain it is, they had of very great *Antiquity* been Consecrated to Holy uses, not onely by Superstitious *Persons* to the Gentile *Deities* and *Heroes*; but the true *God*, by the *Patriarchs* themselves, who *ab initio* (as is presum'd) did frequently retire to such places to serve him in, Compose their *Meditations*, and celebrate Sacred *Mysteries*, *Prayers*, and *Oblations* following the Tradition of the *Gomerites* or Descendants of *Noah* who first Peopl'd *Galata* after the universal *Deluge*. From hence some presume that even the ancient *Druids* had their origin: But that *Abraham* might imitate what the most Religious of that *Age* had practis'd before him may not

not be unlikely; for we read he soon Planted himself and Family at the *Quercetum* of *Mambre*, *Gen.* 13. where as *Eusebius*, *Ecc. Hist.* l. 1. c. 18. gives us the account, He spread his *Pavilions*, erected an *Altar*, Offer'd and perform'd all the Priestly Rites; and there, to the immortal glory of the *Oak*, or rather *Arboreous Temple*, he entertained *God* himself. *Isidor*, *St. Hierom*, and *Sozomenus* report confidently, that one of the most eminent of those *Trees* remained till the Reign of the great *Constantine*, who Founded a venerable *Chappel* under it; and that both the *Christians*, *Jews*, and *Arabs*, held a solemn *Anniversarie* or *Station* there, and believed that from the very time of *Noah* it had been a Consecrated place: sure we are it was about some such assembly of *Trees*, that *God* was pleas'd first of all to appear to the *Father* of the *Faithful* when he established the *Covenant* with him, and more expressly, when removing thence (upon confirming the League with *Abimelech*, *Gen.* 21. and settling at *Bersheba*) he design'd an expresse place for *God's* Divine Service: For there, says the sacred Text, He Planted a Grove, and called upon the Name of the Lord. Such another *rust* we read of (for we must not alwayes restrain it to one single Tree) when the *Patriarch* came to *מורא אילון* *Elon Moreh*, ad *Convallem illustrium*: But whether that were the same in which the *High-Priest* repositied the famous *Stone* after the Exhortation mention'd *Joshua* 24. 26. we do not contend; under an *Oak* sayes the *Scripture*, and it grew near the *Sanctuary*, and probably might be that which his *Grand child* Consecrated with the Funeral of his beloved *Rebecca*, *Gen.* 35. For 'tis apparent by the Context, that There, *God* appeared to him again: So *Grotius* upon the words (*Subter quercum*) *Illam ipsam* (sayes he) *cujus mentio*, *Gen.* 35. 4. in *historia Jacobi* & *Jude*; and adds, *Is locus in honorem Jacobi diu pro templo fuit*. That the very spot was long after us'd for a *Temple* in honour of him.

3. If we would track the Religious esteem of *Trees* and *Woods*, yet farther in *Holy Writ*, we have that glorious *Vision* of *Moses* in the fiery Thicket, and it is not to abuse or violate the Text, that *Moncaus* and others, interpret it to have been an *intire Grove*, and not a single *Bush* onely, which he saw as burning, yet unconsum'd. *Puto ego* (sayes my Authour) *rubri vocabulo non quidem rubum aliquem unicum & solitarium significari, verum rubetum totum, aut potius fruticetum, quomodo de Quercu Mambre pro Querceto toto Docti intelligunt*. Now that they Worshipped in that Place soon after their coming out of *Egypt*, the following story shews; and the *Feast of Tabernacles* had some resemblance of *Patriarchal Devotion* under *Trees*, though but in temporary *Groves* and *Shades* in manner of *Booths*, yet Celebrated with all the refreshings of the *Forest*; and from the very Infancy of the *World* in which *Adam* was entertain'd in *Paradise*, and *Abraham* (as we noted) receiv'd his Divine Guests, not in his *Tent*, but under a *Tree*, an *Oak*, *Triclinium Angelicum* the Antients Dining-Room; all intelligent persons have imbrac'd the solace of shady *Arbours*, and all devout Persons

Persons found how naturally they dispose our Spirits to Religious Contemplations : For this, as some conceive, they much affected to Plant their *Trees* in *Circles*, and gave that capacious Form to the first *Temples*, , observ'd not onely of old, but even at this day by the *Jews*, as the most accommodate for their Assemblies ; or, as others, because that figure most resembl'd the *Universe*, and the *Heavens* : *Templum à Templando* says a knowing *Critic*, and another, *Templum est nescio quid immane, atque amplum* ; such as *Arnobius* speaks of, that had no *Roof* but *Heaven*, till that sumptuous Fabric of *Solomon* was confin'd to *Jerusalem*, and the goodliest *Cedars*, and most costly *Woods* were carried thither to form the *Columns*, and lay the *Rafters* ; and then, and not till then, was it so much as *Schisme* that I can find, to retire to *Groves* for their *Devotion*, or even to *Bethel* it self.

4. In such Recesses were the antient *Oratories* and *Proscenæ* built even amongst the *Gentiles*, as well as the People of *God* (nor is it alwaies the lesse authentical for having been the guise of *Nations*) hence that of *Philo*, speaking of one who *πάσας Ἰσραὴλ ἡγεμονίας ἐξεδιόρμησεν, &c.* that had fell'd all the *Trees* about it ; and such a place the *Satyrist* means, where he asks, *In qua te quero proscencha?* because it was the Rendezvous also, where poor People us'd to frequent to beg the Alms of devout and Charitable Persons ; and it was esteemed piacular for any to cut down so much as a stick about them, unlesse it were to build them, when with the *Psalmist*, men had *honour* according to their forwardnesse of repairing the *Houses* of *God* in the Land, upon which account it was lawful to lift up *Axes* against the goodliest *Trees* in the *Forest* ; but those zealous dayes are past,

Now Temples shut, and Groves deserted ly,
All Gold adore, and neglect Piety.

Et nunc desertis cessant sacraria Lucis
Autum omnes viciâ, jam Pietate colunt.

Propert.

5. They came afterwards indeed to be abus'd to *Superstition*, but what good, or indifferent thing has not been subject to perversion ? It is said in the end of *Isaiah*, *Exprobratur Hebrais quod in Opisthonaïs Idolorum lorti essent in quorum medio febrabantur* ; but how this is applicable to *Groves* does not appear so fully ; though we find them interdicted, *Dent. 16. 21. Judg. 6. 26. 2 Chron. 31. 3. &c.* and forbidden to be Planted neer the *Temple* ; and an impure *Grove* on Mount *Libanus* dedicated to *Venus*, was by an Imperial *Edict* of *Constantine* extirpated ; but from the abuse of the thing to the non-use, the *Consequence* is not alwayes valid, and we may note as to this very particular, that where in divers places of *Holy Writ*, the denuntiation against *Groves* is so expresse, it is frequently to be taken but *catachrestically*, from the *Wooden Image* or *Statue* call'd by that name, as our Learned *Selden* makes out by sundry Instances in his *Syntagma de Diis Syris*.

The Summe of all is, *Paradise* it self was but a kind of *Nemorous Temple* or sacred *Grove*, Planted by *God* himself, and given

to

to *Man*, *tanquam primo sacerdoti*, the Word is עֲבָד which properly signifies to Serve or administer *res divinas*, a place Consecrated for sober Discipline, and to Contemplate those *mysterious* and *Sacramental* Trees which they were not to touch with their hands; and in memory of them, I am inclin'd to believe, Holy Men (as we have shew'd in *Abraham* and others) might Plant and cultivate *Groves*, where they traditionally invoc'd the *Deity*; and St. *Hierom*, *Chrysostom*, *Cyprian*, *Augustine*, and other *Fathers* of the *Church* greatly magnified these pious advantages; and *Cajetan* tells us, that from *Isaac* to *Jacob* and their Descendants they followed *Abraham* in this Custom: In such places were the Monuments of their *Saints*, and the Bones of their *Heroes* deposited; for which *David* celebrated the Humanity of the *Galaadites*, In *Nemora Jabs* as the most sacred and inviolable: In such a place did the *Angel* appear to *Gideon*, and in others *Princes* were *Inaugurated*; so *Abimelec*, *Judic. 9*. And the *Rabbines* add a reason why they were reputed so Venerable; because more remote from Men and Company, more apt to compose the *Soul* and fit it for divine Actions, and sometimes *Apparitions*, for which the first enclosures were attributed to *Groves*, *Mountains*, *Fountains of Water*, and the like solemn objects; as of peculiar Sanctity, and as the old sense of all words denoting *Sanctity* did import separateness and uncommon propriety: See our *Learned Meade*. For though since the *Devils* intrusion into *Paradise*, even the most holy and devoted Places were not free from his Tensions and ugly Stratagems: Yet we find our Blessed *Saviour* did frequently retire into the *Wilderness*, as *Elijah* and St. *John* did before him, and divers other Holy men: The reason is obvious, and I shall shew when I come to speak concerning the use of *Gardens* in another *Work* (long since attempted, and now in some forwardness) how the *Air* of such retired places may be assistant and influential for the inciting of Penitential expressions and affections; especially where one may have the additional assistances of solitary *Grotts*, murmuring Streams, and desolate Prospects: I remember that under a *Tree* was the place of that admirable St. *Augustines* solemn *Conversion*, after all his importunate reluctances: I have often thought of it, and it is a *melting* passage as himself has recorded it, *Con. l. 8. c. 8.* and he gives the reason, *Solitudo enim mihi ad negotium flendi aptior suggerebatur*. And that indeed such opportunities were successful for *Recollection*, and to the very reformation of some ingenious Spirits from secular Engagements to excellent and mortifying Purposes, we may find in that wonderful relation of *Pontianus's* two Friends, great *Courtiers* of the time, as the same Holy *Father* relates it, previous to his own *Conversion*.

6. We shall now in the next place endeavour to shew how this innocent veneration to *Groves* passed from the *People of God* to the *Gentiles*, and by what degrees it degenerated into dangerous Superstitions: For the *Devil* was always *Gods Ape*, and did

so ply his Groves, Altars, and Sacrifices, and almost all other Rites belonging to his Worship, that every Green Tree was full of his Abominations, and places devoted to his impure Service, *Hi fuere* (says *Pliny*, speaking of Groves) *quondam Numinum templa, &c.* These, were of old the Temples of the Gods, and after that simple (but antient Custom) men at this day Consecrate the fairest and goodliest Trees to some Deity or other; nor do we more adore our glittering Shrines of Gold and Ivory, than the Groves, in which with a profound and awful silence, we worship them. For in truth the very Tree it self was sometimes Deified, and that Celtic Statue of Jupiter no better than a prodigious tall Oak, whence 'tis said the Chaldean Theologues deriv'd their superstition towards it; and the Persians we read, us'd that Tree in all their mysterious Rites; so as to some they proceeded to the offering even of humane Sacrifices,

Each Tree besprinkled was with humane gore.

Omnis & humanis illustrata cruoribus arbor.

Lucan l. 3.

Procopius tells us plainly that the *Sclavii* worshipped Trees and whole Forests of them: See *Jo. Dubravius* l. 1. *Hist. Bohem.* and that formerly the *Gandenses* did the like, *Surius* the *Legendary* 6, Feb. reports in the life of *S. Amadus*: So did the *Vandals* says *Albert Crantz*; and even those of *Peru*, as I learn from *Acosta* l. 3. c. 11. But one of the first Idols which procur'd particular veneration in them was the *Sidonian Ashtaroth* who took her name à *Lucis*, as the *Jupiter* ~~was~~ amongst the *Rhodians*, the *Nemorensis Diana* or *Arduenna*, and others who had peculiar Worship in the Groves; so soon had Men degenerated into this irrational and stupid Devotion, that Arch-Fanatic *Sathan* (who began his pranks in a Tree) debauching the Contemplative use of Groves and other Solitudes. Nor were the Heathens alone in this crime, the *Basilidians* and other Heretics even amongst the Christians, did consecrate to the Woods and the Trees their Serpent-footed and barbarous *ABOPAEAS*, as it is yet to be seen in some of their mysterious Talismans and Periapta's which they carried about.

In opere
Paschali.

But the Roman madnesse (like that which the Prophet derides in the Jews) was well perstring'd by *Sedulius* and others for imploring these Stocks to be propitious to them, as we learn in *Cato de R. R.* c. 113. 134. &c. And it was not long after, when they were generally Consecrated by *Faunus*, that they boldly set up his Oracles and Responses in these nemorous places: Hence the Heathen Chappels had the name of *Fana*, and from their wild and extravagant Religion, the Professors of it *Phanatics*; a name well becoming some of our late *Enthusiasts* amongst us; who, when their Quaking fits possesse them, relemble the giddy motion of Trees, whose heads are agitated with every wind of Doctrine.

7. Here we may not omit what Learned men have observ'd concerning the Custome of *Prophets* and Persons inspir'd of old, to sleep upon the Boughs and branches of *Trees* (I do not mean on the *tops* of them, as the *Salvages* somewhere do in the *Indies* for fear of *Wild Beasts* in the night time) but on *Matrasses* and *Beds* made of their Leaves, *ad Consulendum* to ask advise of God. Naturalists tell us, that the *Laurus* and *Agnus Castus* were *Trees* which greatly compos'd the *Phaen*, and did facilitate true *Visions*; and that the *first* was specifically efficacious *ὡς τὰ δωδοναῖα* (as my Authour expresses it) to Inspire a *Poetical* fury: Such a *Tradition* there goes of *Rebecca* the Wife of *Isaack*, in imitation of her *Father in Law*: The Instance is recited out of an ancient *Ecclesiastical History* by *Abulensis*; and (what I drive at) that from hence the *Delphic Tripod*, the *Dodonaean Oracle* in *Epirus*, and others of that nature had their Originals: At this *decubation* upon *Boughs* the *Satyr* seems to hint where he introduces the *Gypsies*.

See S. Hier.
in Trad. Heb.
3 Reg. c. 4.

— with feat
The poor she *Few* begs in my Ladies ear,
The *Groves* high *Prin*esse, Heavens true messenger,
Hierusalem's old *Laves* expounds to her.

*Arcanam Judaea tremens mendicat in aurem
Interpres Legum Solymarum, & magna Sacerdos
Arboris, ac summi fida intermancia Celi.*

Siappon.

Juv. Sat. 6.

For indeed the *Delphic Oracle* (as *Diodorus l. 16.* tells us) was first made *è Lauri ramis* of the *Branches* of *Laurel* transferr'd from *Thessaly*, bended, and arched over in form of a *Bower* or *Summer-house*, a very simple *Fabric* you may be sure: And *Cardan* I remember in his *Book de Fato*, insists very much on the *Dreams* of *Trees* for portents and presages, and that the use of some of them do dispose men to *Visions*.

8. From hence then began *Temples* to be erected and sought to in such Places, and as there was hardly a *Grove* without its *Temple*, so had every *Temple* almost, a *Grove* belonging to it, where they plac'd *Idols*, and *Altars* and *Lights* endow'd with fair *Revenues* which the devotion of *Superstitious* persons continually augmented; and I remember to have seen something very like this in *Italy*, and other Parts, namely, where the *Images* of the *B. Virgin* and other *Saints* have been enshrined in hollow and umbragious *Trees* frequented with much veneration, which puts me in mind of what that great Traveller *Pietro della Valla* relates, where he speaks of an extraordinary *Cypresse*, yet extant, near the Tomb of *Cyrus*, to which at this day many *Pilgrimages* are made; and speaks of a *Gummy* transudation which it yields, that the *Turks* affirm to turn every *Friday* into drops of *Blood*: The *Tree* is hollow within, adorn'd with many *Lamps*, and fitted for an *Oratory*, and indeed some would derive the name *Lucus* a *Grove*, as more particularly to signify such enormous and cavernous *Trees* *quod ibi lumina accenderentur Religionis causa*: But our *Author* adds, The *Ethnics* do still repute all great *Trees* to be *divine*, and the habitation of *Souls* departed: These the *Persians* call *Pir*

Vide Annam
viterb. l. 17.
fol. 158.

and *Imām*. Perhaps such a hollow Tree was that *Asylum* of our Poets *Hero*, when he fled from his burning *Troy*,

— an antient *Cypresse* near
Kept by Religious Parents many a year.

— *jūtaq; antiqua Cupressus*
Religione Patrum multis servata per annos.
Æn. 2.

For that they were places of Protection, and priviledg'd like *Churches*, and *Altars*, appears out of *Livy* and other good Authority: Thus where they introduce *Romulus* encouraging his new Colony,

So soon as ere the Grove he had immur'd
Hast hither (says he) *hæc* you are secur'd.

— *ut saxo Lucum circumdedit alto*
Quilibet, hæc, dicit, Confuge, tutus eris.

Such a Sanctuary was the *Aricina*, and Suburban *Diana*, call'd the *Nemorale Templum*, and divers more which we shall reckon up anon.

9. The Mysteries which the famous *Druids* celebrated in their Woods and Forests, are at large to be found in *Cæsar*, *Pliny*, *Strabo*, *Diodorus*, *Mela*, *Apuleius*, *Ammianus*, *Lucan*, *Aventinus*, and innumerable other Writers, where you will see that they chose the Woods and the Groves, not onely for all their Religious Exercises, but their Courts of Justice; as the whole Institution and Discipline is recorded by *Cæsar*, l. 6. and as he it seems found it in our Countrey of *Britain*, from whence it was afterwards translated into *Gallia*: For he attributes the first rise of it to this once happy Island of Groves, and Oaks; and affirms that the antient *Gauls* travelled hither for their initiation. To this *Tacitus* assents, 14 *Annal.* and our most Learned Critics who vindicate it both from the *Greeks* and *French*, who frequently challenge it: But the very Name it self, which is purely *Celtic*, does best decide the Controversie: For though *Drus* be *Quercus*; yet *Vossius* skilfully proves that the *Druids* were altogether strangers to the *Greeks*; but what comes yet nearer to us, *Dru*, *fides* (as one observes) begetting our now antiquated *Trou*, or *True*, makes our title the stronger: Add to this, that amongst the *Germans* it signified no lesse than *God* it self; and we find *Drutin* or *Trydin* to import *Divine* or *Faithful* in the *Othfridian Gospel*, both of them *Sacerdotal* expressions. But that in this Island of ours men should be so extremely devoted to Trees, and especially to the Oak, the strength and defence of all our enjoyments, inviron'd as we are by the Seas, and Martial Neighbours, is lesse to be wonder'd,

Our Brittish *Druids* not with vain intent,
Or without Providence did the *Oke* frequent;
That *Albion* did that Tree so much advance
Nor Superstition was, nor ignorance
Those Priests divining even then, bespoke
The mighty Triumphs of the *Royal Oake*.
When the Seas Empire with like boundlesse fame
Victorious *CHARLES* the son of *CHARLES* shall
(claim)

*Non igitur Dryada nostrates pictore vano
Nec sine consulto coluerunt Namine Quercum,
Non illam Albionis jam tum celebravis honore
Stulta Superstitio, venturior inscia seculi
Angliaci ingentes puto prævidisse triumphos
Roboris, Imperiumque maris quod maximus olim,
CAROLIDES vasa Visor ditione tenebat.*

Coultell L. 6. Pl.

as we may find the *Prediction* gloriously followed by our ingenious *Poet*, where his *Dryad* consigns that Sacred *Depositem* to this *Monarch* of the *Forest* the *Oak*, than which nothing can be more sublime and rapturous.

10. From those *Sylvan Philosophers* and *Divines* (not to speak much of the *Indian Brachmans* descended of the antient *Gymnosophists*) 'tis believed that the great *Pythagoras* might Institute his silent *Monasterie*; and we read that *Plato* entertain'd his Auditors amongst his Walks of *Trees*, which were afterward defac'd by the inhumanity of *Sylla*, when as *Appian* tells us, he cut down those venerable shades to build Forts against *Pyraus*: And another we find he had, Planted near *Anicerides* with his own hands, wherein grew that celebrated *Platanus* under which he introduces his Master *Socrates* discoursing with *Phædon de Pulchro*: Such another place was the *Athenian Cephisia* as *Agellius* describes it: *Democritus* also taught in a Grove, as we find in that of *Hippocrates* to *Damagetus*, where there is a particular Tree design'd ad *Otium literarum*; and I remember *Tertullian* calls these places *Studia opaca*: I could here tell you of *Palæmon*, *Timon*, *Apollonius*, *Theophrastus*, and many more that erected their Schools in such Colleges of *Trees*, but I spare my Reader; I shall onely note that 'tis reported of *Thucydides* that he compiled his noble *History* in the *Scaplan Groves*. as *Pliny* writes; and in that matchless piece de *Oratore*, we shall find the Interlocutors to be often under the *Platanus* in his *Tusculan Villa*, where invited by the freshnesse and sweetness of the place *Admonuit* (says one of them) *me hæc tua Platanus quæ non minus ad opacandum hunc locum patulis & diffusa ramis quam illa, cujus umbram secutus est Socrates, quæ mihi videtur non tam ipsa aquila, quæ describitur, quàm Platonis oratione crevisse, &c.* as the *Orator* brings it in, in the person of one of that meeting.

I confesse *Quintilian* seems much to question whether such places do not rather perturb and distract from an *Orators* Recollection, and the depths of Contemplation: *Nontamen* (says he) *protinus audiendi, qui credunt aptissima in hoc Nemora, sylvasque, quod illa cæli libertas, locorumque amenitas, sublimem animum, & beatiorum spiritum parent: Mihi certè jucundus hic magis; quàm studiorem hortator videtur esse secessus: Namq; illa ipsa quæ delectant, necesse est avocent ab intentione operis destinati: He proceeds — Quare Sylvarum amenitas, & præter labentia flumina, & inspirantes ramis arborum auræ, volucrumque cantus & ipsa latè circumspiciendi libertas, ad se trahunt; ut mihi remittere potius voluptas ista videatur cogitationem quam intendere.* But this is onely his singular suffrage, which as conscious of his Error, we soon hear him retract, when he is by and by as loud in its Praises, as the *Places* in the World, the best fitted for the diviner *Rhetorique* of Poetry: But let us admit another to cast in his Symbol for Groves: *Nemora* (says he) *& Luci, & secretum ipsum, tantam mihi afferunt voluptatem ut inter precipuos Carminum fructus, majorem, quod nec in strepitu, nec sedente*

antè

ante hostium litigatore, nec inter sordes & lacrymas reorum comprimantur: Sed secedit animus in loca pura, atque innocentia, fruturque sedibus Sacris.

And indeed the Poets thought of no other Heaven upon Earth, or elsewhere; for when *Anchises* was setting forth the felicity of the other life to his Son, the most lively description he could make of it was to tell him,

— We dwell in shady Groves,

— *Luce habitationis opacis*

and that when *Aeneas* had travell'd far to find those happy Abodes,

They came to Groves, of happy Souls the Rest
To Ever-greens, the dwellings of the Blest.

*Devenere locos lator, & amara vireta
Fortunatorum Nemorum, Sedeque beator.*

Such a prospect he gives us of his *Elysium*; and therefore wise and great Persons had alwayes these sweet opportunities of Recesse, their *Domos Sylva*, as we reed, 2 Reg. 7. 2. which were thence called *Houses of Royal Refreshment*, or as the *Septuagint* *οἶκος δρυῶν*, not much unlike the Lodges in divers of our Noble mens *Parks*, and *Forest-Walks*; which minds me of his choice in another Poem,

In lofty Towers let *Pallas* take her rest,
Whilst shady *Groves* 'bout all things please us best.

— *Pallas quas condidit arces,
Ipsa colat, nobis placeant ante omnia Sylva.*
Eclog. 2.

And for the same reason *Mecænas*

— Chose the broad Oak —

Moluit umbram Quercum —

and as *Horace* bespeaks them,

At the cool Woods above the rest advance
Where the rough *Satyrs* with the light *Nymphs* dance.

— *At gelidum nemus
Nympharumq; levis cum Satyris Chori,
Secernunt populo* —

and *Virgil* again,

Our sweet *Thalia* loves, not does she scorn
To haunt umbragious Groves —

Nostra nec erubuit Sylvas habitare Thalia;

or as *thus* expressed by *Petrarch*,

— The *Muse* her self enjoys
Best in the Woods, verſe flies the City noyse.

Sylva placet Musis, urbs est inimica Poetis

So true is that of yet a better Poet of our own;

As well might *Corn*, as *Versè* in Cities grow,
In vain the thanklesse Glebe we Plow and Sow,
Against th' unnatural Soil in vain we strive,
'Tis not a ground in which these Plants will thrive.

Conley:

When

When it seems they will bear nothing but *Nettles*, and *Thorns* of *Satyrs*, 'and as *Juvenal* says, by *Indignation* too; and therefore 'almost all the *Poets*, except those who were not able to eat 'Bread without the Bounty of Great men; that is, without what 'they could get by flattering them (which was *Homer's* and *Pindar's* case) have not onely withdrawn themselves from the *Vices* and *Vanities* of the great *World*, into the innocent felicities 'of *Gardens*, and *Groves*, and *Retiredness*, but have also commended and adorned nothing so much in their never-dying *Poems*. Here then is the true *Parnassus*, *Castalia*, and the *Muses*, and at every call in a *Grove* of *Venerable Oaks*, methinks I hear the answer of an hundred old *Dryads*, and the *Bards* of our inspired Ancestors.

Innumerable are the Testimonies I might produce in behalf of *Groves* and *Woods* out of the *Poets*, *Virgil*, *Gratius*, *Ovid*, *Horace*, *Claudian*, *Statius*, *Silius*, and others of latter times, especially the divine *Petrarch*; were I minded to swell this *Charming Subject*, beyond the limits of a *Chapter*: I think onely to take notice, that *Theatrical Representations*, such as were those of the *Ionian* call'd *Andria*; the *Scenes* of *Pastorals*, and the like innocent Rural Entertainments were of old adorn'd and trimm'd up *è ramis & frondibus, cum racemis & corymbis*, and frequently represented in *Groves*, as the Learned *Scaliger* shews: And here *Enkultion* the most beloved of *Apollo* rooted his coy *Mistress*, and the noblest Raptures have been conceiv'd in the Walks and shades of Trees, and *Poets* have compos'd *Verses* which have animated men to Heroic and glorious Actions; here *Orators* (as we shew'd) have made their *Panegyrics*, *Historians* grave Relations, and the Profound Philosophers lov'd here to pass their lives in repose and Contemplation, and the frugal Repasts — *mollesque sub arbore somni* were the natural and chaste delights of our *Fore-Fathers*.

12. Nor were *Groves* thus onely frequented by the great *Scholars*, and the great *Wits*, but by the greatest *Statesmen* and *Politicians* also; and the *Athenians* were wont to Consult of their gravest matters and Publick Concernments in them. Famous for these *Assemblies* were the *Ceraunian*, and at *Rome* the *Lucus Petilinus*, the *Farentinus*, and others, in which there was held that renowned *Parliament* after the Defeat of the *Gaules* by *M. Popilio*: For 'twas supposed that in places so Sacred, they would Faithfully and Religiously observe what was Concluded amongst them.

In such green Palaces the first Kings reign'd,
Slept in their Shades, and Angels entertain'd:
With such old Counsellors they did advise,
And by frequenting Sacred Groves, grew Wise;
Free from th' impediments of Light and Noyse,
Man thus retir'd, his nobler thoughts employs.

Mr. Waller.

A3

L. 12. c. 44.
Arist. l. Ep. 10.

Vide Sym-
mach. l. 4.
Ep. 28.

As our excellent *Poet* has describ'd it : and amongst other weigh-ty matters they treated of *Matches* for their *Children*, and the Young people made *Love* in the cooler *Shades*, and ingrav'd their *Mistress's* Names upon the *Bark*, *tituli areis literis insculpti* as *Pliny* speaks of that Antient *Vatican Ilex*, and *Enripides* in *Hippolyto*, where he shews us how they made the incision, whisper their soft Complaints like that of *Aristanetus* *Tōia Nēidē ē Nēlepa*, &c. and wish that it had but a Soul and a Voice to tell *Cydippe*, the fair *Cydippe*, how she was belov'd : And doubtlesse this *Character* was Antienter than that in *Paper*; let us hear the Amorous *Poet* leaving his young Couple thus Courting each other.

My name on Bark engraven by your fair hand,
Ornone, there, cut by your knife does stand;
And with the Stock my Name alike do's grow,
Be't so, and my advancing honour show.

*Incise servant a te mea nomina fagi
Et Legor Oenone falce notata tua,
Et quantum trunci, tantum mea nomina cresunt,
Crescite, & in titulos surgite rite meos.*

Ovid. Ep.

which doubtlesse he learnt of *Maro* describing the unfortunate *Gallus*.

There on the tender bark to carve my Love;
And as they grow, so shall my hopes improve.

— tenerisque meas incidere amoris
Arboribus: Crescentibus, crescentis amores.

Ogilby.

Eclog. 10.

and these pretty Monuments of Courtship I find were much used on the *Cherry-tree* (the *Wild one* I suppose) which has a very smooth *Rind*, as the witty *Calsurnius*,

Repeat, thy words on Cherry-bark I'll take,
And that red skin my Table-book will make.

*Dic age, nam Cerasifera cortice verba notabo
Et decisa feram rusticanti carmina libro.*

From *Olympius Nemesianus*, and others, for we have dwelt too long on this trifle, but we will now change the *Scene* as the *Aegyptians* did the mirth of their *Guests* when they serv'd in a *Scull* to make them more serious. For,

13. Amongst other Uses of *Groves*, I read that some Nations were wont to hang, not Malefactors onely, but their departed Friends, and those whom they most esteemed upon *Trees*, as so much nearer to *Heaven*, and dedicated to *God*; believing it far more honourable than to be buried in the *Earth*; and that some affected to repose rather in these Woody places *Propertius* seems to bespeak.

The Gods forbid my Bones in the high-Road
Should lye, by every wandring vulgar trod;
Thus buried Lovers are to scorn expos'd,
My Tomb in some by Arbor be inclos'd.

*Di faciant mea ne terrâ locet ossa frequens
Quâ facit assiduo tramite vulgus iter,
Post mortem tumuli sic infamantur amantum,
At tegat arboreâ devota terra comâ.*

The same is affirmed of other *Septentrional* People by *Chr. Cili-cus de Bello Dithmarfico* l. 1. We have already mention'd *Rebecah*, and read of *Kings* themselves that honoured such places with their *Sepulchres*: What else should be the meaning of 1 *Chro.*

10. 12. when the valiant men of *Jabesh* interr'd the Bones of *Saul* and *Jonathan* under the *Oke*. Famous was the *Hyrnethian* *Cameterie* where *Daiphon* lay; *Ariadnes* Tomb was in the *Ama-thusian* Grove in *Crete*, now *Candie* : For they believed that the Spirits and Ghosts of Men delighted to expatiate and appear in such solemn places, as the Learned *Grotius* notes from *Theophylact*, speaking of the *Demons*, upon *Mat. 8 20.* for which cause *Plato* gave permission, that *Trees* might be Planted over *Graves*, to obumbrate and refresh them.

Our Blessed *Saviour* chose the *Garden* sometimes for his *Oratory*, and dying, for the place of his *Sepulchre*; and we do avouch for many weighty causes, that there are none more fit to bury our Dead in, than in our *Gardens* and *Groves*; where our *Beds* may be decked with verdant and fragrant *Flowers*, *Trees* and *Perennial* Plants, the most natural and instructive *Hieroglyphics* of our expected *Resurrection* and *Immortality*, besides what they might conduce to the Meditation of the *living*, and the taking off our Cogitations from dwelling too intently upon more vain and sensual Objects; that *Custom* of *Burying* in *Churches*, and near about them (especially in great and populous *Cities*) being both a *Novel* Presumption, undecent, and very unhealthful.

14. To make this *Discourse* the more absolute, we shall add a short recital of the most famous *Groves* which we find Celebrated in *Histories*; and those, besides many already mention'd, were such as being Consecrated both to *Gods* and *Men*, bore their Names : Amongst these are reckoned the Sacred to *Minerva*, *Isis*, *Latona*, *Cybele*, *Osiris*, *Æsculapius*, *Diana*, and especially the *Aricinian*, in which there was a goodly *Temple* erected, placed in the midst of an *Island*, with a vast *Lake* about it, a *Mount*, and a *Grotto* adorn'd with *Statues*, and irrigated with plentiful *Streams* : and this was that renowned *Recess* of *Numa*, where he so frequently conversed with his *Ageria*, as did *Minos* in the *Cave* of *Jupiter*, and by whose pretended Inspirations they gain'd the deceived People, and made them receive what *Laws* he pleas'd to impose upon them. To these we may joyn, the *Groves* of *Vulcan*, *Venus*, and the little *Cupid* : *Mars*, *Bellona*, *Bacchus*, *Sylvanus*, the *Muses*, and that neer *Helicon* from the same *Numa*, their great *Patron*; and hence had they their Name *Camæna*. In this was the noble *Statue* of *Eupheme* Nurse to those *Poetical* Ladies; but so the *Feranian* and even *Mons Parnassus*, were thick shaded with *Trees*. Nor may we omit the more impure *Lupercal* *Groves* Sacred, or *Prophan'd* rather, yet most famous for their affording shelter and foster to *Romulus*, and his Brother *Rhemus*.

That of *Vulcan* was usually guarded by *Dogs*, like the Town of *S. Malo* in *Bretaigne* : The *Pinea Sylva* appertain'd to the Mother of the *Gods*, as we find in *Virgil*. *Venus* had several *Groves* in *Egypt*, and in the *Gnidian* *Island*, where once stood those famous *Statues* cut by *Praxiteles*; another in *Pontus*, where (if

you'll believe it) hung up the *Golden Fleece* for the bold Adventurer. Nor was the Watry-King *Neptune* without his *Groves*, the *Helicean* in *Greece* was his : So *Ceres*, and *Proserpine*, *Pluto*, *Vesta*, *Castor* and *Pollux* had such shady Places Consecrated to them ; add to these the *Lebadian*, *Arfinoan*, *Paphian*, *Senonian*, and such as were in general dedicated to all the *Gods*.

— The Gods have dwelt in Groves.

— *Habitarunt dii quoque Sylva.*

And these were as it were *Pantheons*. To the memory of famous *Men* and *Heros* were Consecrated the *Achillean*, *Aglauran*, and those to *Bellerophon*, *Heſtor*, *Alexander*, and to others who disdained not to derive their Names from *Trees* and *Foreſts*; as *Sylvius* the *Poſthumus* of *Aeneas*; divers of the *Albanian* Princes, and great Persons; *Stolon*, *Laura*, *Daphnis*, &c. And a certain Custom there was for the *Parents* to Plant a *Tree* at the *Birth* of an *Heir* or *Son*, preſaging by the growth and thriving of the *Tree* the proſperity of the *Child* : Thus we read in the life of *Virgil*, and how far his *Natalitial Poplar* had out-ſtrip'd the reſt of its *Contemporaries*. And the reaſon doubtleſſe of all this was, the general repute of the Sanctity of thoſe Places; for no ſooner does the *Poët* ſpeak of a *Grove*, but immediately ſome Conſecration follows, as believing that out of thoſe ſhady Profundities ſome *Deity* muſt needs emerge,

Quo poſſis viſo dicere Numen ineſt.

ſo as *Tacitus* (ſpeaking of the *Germans*) ſayes, *Lucos & Nemora conſecrant, Deorumque nominibus appellant ſecretum illud, quod ſola reverentiâ vident* ; and the Conſecration of theſe *Nemorous* places we find in *Quintus Curtius*, and in what *Paulus Diaconus de Lege* relates of the *Longobards* where the *Rites* are expreſſe, allur'd as 'tis likely by the gloomineſſe of the *Shade*, procerity and altitude of the *Stem*, floridneſſe of the *leaves* and other accidents, not capable of *Philosophizing* on the *Phyſical Cauſes*, which they deem'd ſupernatural, and plainly *divine* ; ſo as to uſe the words of *Prudentius*,

Here all Religion paid ; whoſe dark Reſeſſe
A ſacred awe does on their mind impreſſe,
To their Wild Gods——

*Quos ponas omnes ſacrum eſt, quicquid formido tremendum
Suaſerit horrificos, quos prodigialis cognos
Monſtra Dei——*

L. 2. Cent. Sym.

And this deification of their *Trees*, and amongſt other things, for their *Age* and perennial viridity, ſayes *Diodorus*, might ſpring from the manifold uſe which they afforded, and happily had been taught them by the *Gods*, or rather by ſome *God-like* perſons, whom for their worth and the publick benefit they eſteemed ſo ; and that divers of them were voyc'd to have been *Metamorphoz'd* from

from *Men* into *Trees*, and again out of *Trees* into *Men*, as the *Ar-
cadians* gloried in their *Birth*, when

Out of the teeming Bark of Oakes men burst.

Quisq[ue] virum, trunci, & rupto robore nati.

which perhaps they fancied, by seeing men creep sometimes out
of their Cavities, in which they often lodg'd and secur'd them-
selves;

For in th' Earths non-age under Heavens new frame,
They stricter liv'd, who from Oaks rupture came.

Staphylon.

*Quippe aliter tunc orbe novo cœloque recenti
Vivebant homines qui rupto robore nati, &c.*

Juven. l. 2. S. 6.

Or as the sweet *Papinius*,

Fame goes that thou brake forth from the hard rind,
When the new earth with the first feet was sign'd:
Fields yet nor Houses doleful pangs reliev'd
But shady Ash the numerous births receiv'd,
And the green Babe drop'd from the pregnant Elm,
Whom strange amazement first did over-whelm
At break of day, and when the gloomy night
Ravish'd the Sun from their pursuing light,
Gave it for lost——

—— *Nemorum vos Hirpe rigenti
—Fama satos, cum prima pedum vestigia tellus
Admirata tulit, nondum arva, domusque ferebant
Cruda puerperis, ac populos umbrosa creavit,
Fraxinus, & fœdâ viridis puer excidit Orno:
Hi Lucis stupuisse vices, nostisque feruntur,
Nubila, & occiduum Longe Titana secuti
Desperasse diem——*

almost like that which *Rinaldo* saw in the *Inchanted Forest*.

An aged Oak beside him cleft and rent,
And from his fertile hollow womb forth went
(Clad in rare woods, and strange habilement)
A full grown Nymph.——

*Quercia gli appar, che per se stessa incisa
Aprè seconda il cavo ventre, & figlia:
E n' esce fuor vestita in strania guisa
Ninfa d'età cresciuta.——*

Canto 18.

And that every great *Tree* included a certain tutelar *Genius* or
Nymph living and dying with it, the *Poets* are full; a special in-
stance we have in that prodigious *Oak* which fell by the fatal
stroke of *Erisichthon*; but the *Hamadryads* it seems were immor-
tal, and had power to remove, and change their wooden habi-
tations.

15. We might here produce wonderful strange *Apparitions* of
this nature, interceding for the standing, and life of *Trees*, when
the *Ax* has been ready for Execution, as you may see in that *Hymn*
of *Callimachus*, *Pausanias*, and the famous story of *Parabius* re-
lated by *Apollonius* in 2. *Argonaut.* with the fearful *Catastrophe* of
such as causelessly and wantonly violated those goodly *Plantations*
(from which *fables* arose, that of the *Dodonean* and *vocal Forests*,
frequent in *Heathen Writers*) but by none so Elegantly as the
witty *Ovid*, describing the *Fact* of the wicked *Erisichthon*.

*In Pboz. &
Arcad.*

——Who Gods despis'd,

Nor ever on their Altars sacrific'd, *Sperneret, & nullos aris adoleret*
(honores &c.)

Who *Ceres* Groves with steel prophan'd: Where stood
An old huge *Oak*; even of it self a Wood.

I i 2

Wreaths,

Wreaths, Ribands, grateful Tables deckt his boughs
 And sacred Stem; the Dues of powerful Vows.
 Full oft the *Dryades*, with Chaplets crown'd,
 Danc't in the shade; full oft they tript a Round
 About his bole. Five Cubits three times told
 His ample Circuit hardly could infold.
 Whose stature other Trees as far exceeds,
 As other Trees surmount the humble Weeds.
 Yet this his Fury rather did provoke:
 Who bids his Servants fell the Sacred *Oak*,
 And snatches, while they paus'd, an *Ax* from one,
 Thus storming: Not the *Goddeſſe* lov'd alone;
 But, though this were the *Goddeſſe*, she should down,
 And sweep the Earth with her aspiring Crown.
 As he advanc'd his Arms to strike, the *Oak*
 Both sigh'd and trembl'd at the threatning stroke.
 His Leaves and Acorns, pale together grew,
 And colour-changing-branches sweat cold deaw:
 Then wounded by his impious hand, the Blood
 Gush'd from th' incision in a purple flood:
 Much like a mighty *Ox*, that falls before
 The Sacred Altar, sprouting streams of gore.
 On All amazement seiz'd: When One of all
 The Crime deters, nor would his *Ax* let fall.
 Contracting his stern brows; Receive, said he,
 Thy Pieties Reward; and from the Tree
 The stroke converting, lops his Head; then strake
 The *Oak* again; from whence a Voyce thus spake:
 A *Nymph* am I, within this Tree inshrind,
 Belov'd of *Ceres*, O prophane of mind,
 Vengeance is near thee: With my parting breath,
 I Prophecy, a Comfort to my Death.
 He still his guilt pursues; who over-throws
 With Cables, and innumerable blows
 The sturdy *Oak*; which nodding, long, down rush'd,
 And in his lofty fall his fellows crush'd.

Sandys.

But a sad *Revenge* follows it, as the *Poet* will tell you; and one might fill a just *Volume* with the *Histories* of *Groves* that were violated by wicked Men, who came to fatal periods.

It is reported that the *Minturensian Grove* was esteem'd so venerable, that a stranger might not be admitted into it; and the great *Xerxes* himself when he pass'd through *Achaia*, would not touch a *Grove* which was dedicated to *Jupiter*, Commanding his Army to do it no Violence, and the honours he did to one single (but a goodly) *Platanus* we have already mention'd. The like to this we find when the *Persians* were put to flight by *Pausanias*; though they might have sav'd their lives by it, as appears
 in

in the Story. The same reverence made that *Hercules* would not so much as tast the *Waters* of the *Agerian Groves* after he slew *Cacus*, though extreemly thirsty.

— The Priestesse se'd
(A purple Fillet binding her gray head)
Stranger, pry not, but quit this shady Seat,
Avant, and whiles thou safely may, Retreat,
To men forbid, and by hard Sanction bound:
Far better other Springs were by you found.

*Puniceo canas flamine vincula comas,
Parce oculis hospes, Lucisque abscede verenda
Cede ogedum, Et tuta limina linque fuga,
Interdita vivis, metuenda lege piatur
Di tibi dent alios fontes*—

Propert. l. 4.

Nor indeed in such places was it lawful to *Hunt*, unlesse it were to kill for *Sacrifice*, as we read in *Arrianus*; whence 'tis reported by *Strabo*, that in the *Ætolian Groves* Sacred to *Diana*, the *Beasts* were so tame, that the very *Wolves* and *Staggs* fed together like *Lambs*, and would follow a man licking his hands, and fauning on him. Such a *Grove* was the *Crotonian*, in which *Livy* writes, there was a spacious Field stor'd with all sorts of *Game*. There were many *Forests* consecrated to *Jupiter*, *Juno*, and *Apollo*; especially the famous *Epidaphnes* near the *Syrian Antioch*, which vvas most incomparably pleasant, adorn'd vvith *Fountains* and rare *Statues*. There vvas to be seen the *Laurel* vvhich had been his chaste *Mistress*, and in the Center of it his *Temple* and *Asylum*: Here it vvas *Coffers* and *Julian* did *Sacrifice* upon several occasions as *Ensebius* relates, but could not vvith all their impious *Arts* obtain an *Answer*; because the holy *Babylas* had been interr'd near that *Oracle*, for vvhich it vvas reputed so venerable, that there remained an expresse *Title* in the *Code de Cupressis ex Luco Daphnes non excidendis, vel venundandis*, that none should either fell, or sell any of the *Trees* about it, which may serve for another Instance of their *Burying* in such places. The truth is, so exceedingly *Superstitious* they were and tender, that there was almost no meddling with these devoted *Trees*, and even before they did but *conlucare* and prune one of them, they were first to *Sacrifice*, least they might offend in something ignorantly: But to *Cut down* was *Capital*, and never to be done away with any *Offering* whatsoever; and therefore *Conlucare* in *Anthours* is not (as some pretend) *Succidere*, but to *prune* the *Branches* onely, and yet even *this* gentle tonsure of superfluities was reputed a kind of *Contamination*; and hence *Lucus cōinquinari dicitur*, unlesse in the case of *Lightning* when *Calo tacti*, a whole *Tree* might quite be fell'd, as mark'd by *Heaven* for the *Fire*. But of this sufficient: We could indeed fill many sheets with the *Catastrophe* of such as maliciously destroy'd *Groves* to feed either their revenge or avarice: See *Plutarch* in *Pericles*, and the saying of *Pompeius*: *Cicero* sharply reproves *G. Gabinus* for his prodigious spoil in *Greece*, and it was of late dayes held a piece of *Inhumanity* in *Charles* the *French King*, when he entred the *Frisons* after he had slain their *Leader*, to cut down their *Woods*, a punishment never inflicted by sober *Princes* but to prevent *Idolatry* in the *Old Law*; and to shew the heinous-

*Salmut. exar.
Plin. Soliv.*

nt sic

ness of disloyalty and *Treason* by latter *Sanctions*, in which case, and for *Terror*, even a *Traitors* Woods have become *Anathema*, as were easie to instance out of *Histories*.

16. But what shall we say then of our late prodigious *Spoilers*, whose furious devastation of so many goodly *Woods* and *Forests*, have bequeath'd an Infamy on their *Names* and *Memories* not quickly to be forgotten! I mean our unhappy *Usurpers*, and injurious *Sequestrators*; not here to mention the deplorable necessities of a Gallant and Loyal *Gentry*, who for their *Compositions* were (many of them) compell'd to add yet to this *Wast*, by an inhumane and unparallel'd *Tyrannie* over them, to preserve the poor remainder of their *Fortunes*, and to find them *Bread*.

Nor was it here they desisted, when, after the Fate of that once beautiful *Grove* under *Greenwich-Castle*, the Royal *Walk* of *Elms* in *St. James's Park*,

That living Gallery of aged Trees,

was once propos'd to the late *Council of State* (as they call'd it) to be cut down and sold, that with the rest of his *Majesties* Houses already demolished, and mark'd out for Destruction, his *Trees* might likewise undergo the same destiny, and no footsteps of *Monarchy* remain unviolated.

17. It is from hence you may calculate what were the *designs* of those excellent *Reformers*, and the care these great *Statesmen* took for the preservation of their *Country*, when being *Parties* in the *Booty* themselves, they gave way to so dishonourable and impolitic a *Wast* of that *Material*, which being left intire, or husbanded with discretion, had prov'd the best support and defence of it. But this (say they) was the Effect of *War*, and in the height of our *Contentions*. No, it was a late and cold *deliberation*, and long after all had been subdu'd to them; nor could the most implacable of *Enemies* have express'd a Resolution more barbarous.

We have spoken of the great *Xerxes*, that passing Conquerour through *Achaia*, he would not suffer his *Army* to violate so much as a *Tree* of his *Adversaries*; and have sufficiently observed from the *Antients*, that the *Gods* did never permit them to escape unpunish'd who were injurious to *Groves*. What became of *Agamemnon's* Host after his Spoil of the *Woods* at *Aulis*? *Histories* tell us *Cleomenes* died mad: The *Temesean Genius* became proverbial; and the destructive fact that the enraged *Caesar* perpetrated on the *Massilian Trees*, went not long unreveng'd, thus related by the *Poet*, and an illustrious *Record* of all we have hitherto produc'd, to assert their Veneration.

Lucus erat longo nunquam violatus ab ævo, &c.

Lucan. l. 3.

A Wood untouch'd of old was growing there
Of thick-set Trees, whose boughs spreading and fair
Meeting, obscured the inclosed Air,

And

And made dark shades exiling *Phæbus* Rayes :
 There no rude Fawn, nor wanton Sylvan playes;
 No Nymph disports, but cruel Deities
 Claim barbarous Rites, and bloody Sacrifice :
 Each Tree defil'd with humane blood ; if we
 Believe Traditions of Antiquity :
 No Bird dares light upon those hollowed boughs,
 No Beasts make there their dens ; no wind there blows ;
 No lightning falls : a sad religious awe,
 The quiet Trees unstirr'd by wind do draw.
 Black water Currents from dark Fountains flow :
 The Gods unpolish'd Images do know
 No art, but plain, and formlesse trunks they are.
 Their mosse and mouldiness procures a fear :
 The common figures of known Deities
 Are not so fear'd : not knowing what God 'tis,
 Makes him more awfull : by relation
 The shaken Earths dark caverns oft did grone :
 Fall'n *Yew-trees* often of themselves would rise :
 With seeming fire oft flam'd th'unburned Trees :
 And winding dragons the cold *Oaks* embrace,
 None give neer worship to that baleful place ;
 The People leave it to the Gods alone.
 When black night reigns, or *Phæbus* gilds the Noon,
 The Priest himself trembles, afraid to spy
 In th'awful Woods its Guardian-Deity.

But now *Erisichthon*-like, and like him in *Punishment* ; for *he*
 was Hunger, *Cæsar*'s Thirst, and thirst of Humane Blood, re-
 veng'd soon after in his *Own*.

The *Wood* he bids them fell, not standing far
 From all their Work : untoucht in former War,
 Among the other bared Hills it stands
 Of a thick growth ; the Souldiers valiant hands
 Trembled to strike, mov'd with the Majestie,
 And think the *Ax* from off the Sacred Tree
 Rebounding back, would their own bodies wound :
 Th'amazement of his Men when *Cæsar* found ;
 In his bold hand himself an *Hatchet* took,
 And first of all assaults a lofty *Oak*,
 And having wounded the Religious Tree,
 Let no man fear to fell this Wood (quoth he)
 The guilt of this Offence let *Cæsar* bear. &c.

May.

and so he did soon after, carrying to the Grave ('tis thought) the
Maledictions of the incensed *Gauls* to his Funeral-pile,

— For who
 The Gods thus injur'd, unreveng'd does go?

— *Quæ enim læsæ impunitæ parent?*
Esse Deos —

18. But

18. But least this be charg'd with *superstition*, because the *Instances* are *Heathen*: It was a more noble and remarkable, as well as recent *Example*, when at the *Siege of Breda*, the late Famous General *Spinola* Commanded his *Army* not to violate a *Tree* of a certain *Wood* belonging to the *Prince of Orange* there, though a reputed *Traytor*, and in open defiance with his Master. In sum, we read, that when *Mithridates* but deliberated about the cutting down of some stately *Trees* which grew near *Patara*, a *City* of *Lycia*, though necessitated to it for the building of *Warlike Engines* with them, being terrifi'd in a *Vision*, he desisted from his purpose. It were to be wish'd *these*, or the like *Examples*, might have wrought some *Effects* upon the *Sacrilegious Purchasers*, and disloyal *Invadere* in this *Iron-Age* amongst us, who have lately made so prodigious a *spoyle* of those goodly *Forests, Woods, and Trees* (to gratifie an impious and unworthy *Avarice*) which being once the *Treasure* and *Ornament* of this *Nation*, were doubtlesse reserved by our more prudent *Ancestors* for the repairs of our floating *Castles*, the *safeguard* and *boast* of this renowned *Island*, when *Necessity*, or some imminent *Peril* should threaten it, or call for their *Assistance*; and not to be devoured by these improvident *Wretches*, who, to their eternal *Reproach*, did (with the *Royal Patrimony*) swallow likewise *Gods own Inheritance*; but whose *Sons* and *Nephews* we have liv'd to see hastily disgorge them again; and with it all the rest of their *Holy Purchases*, which otherwise they might securely have enjoy'd. But this, in *terrorem* onely, and for *Caution* to *Posterity*, whiles we leave the *Guilty*, and those who have done the *Mischiefs*, to their proper *Scorpions*, and to their *Erisichthonian-fate*, or that of the inexorable *Parabius*, the vengeance of the *Dryads*, and to their *Tutelary* better *Genius*, if any yet remain, who love the solid *Honour* and *Ornament* of their *Countrey*: For what could I say lesse, *Taylors*, and * *Wood-born* as I am, in behalf of those *Sacred Shades*, which both grace our *Habitations*, and *Protect* our *Nation*?

Qua tibi fa-
storum penas
inflare tuorum
Vaticinor —

Vide Met. l. 8.
Apollon. l. 2.
Argonaut.
Prosternit
quercum fune-
ram quam sibi
Nympha pigno-
ribisque suis
fecit —

* At Wootton in
Surrey: For
so in all ages

from *Trees* have been denominated whole *Countreys, Regions, Cities* and *Towns*; as *Cyparissa* in *Greece*, *Cerasus* in *Pontus*, *Laurentum* in *Italy*, *Myrrhinus* in *Attica*. *Ports, Mountains* and *eminent Places*; as the *Viminalis, Esculetum, &c.* The reason is obvious, from the spontaneous growth and abounding of such *Trees* in the respective *Soyles*.

19. But I acknowledge how easie it is to be lost in this *Wood*, and that I have hardly power to take off my *Pen* whilst I am on this delightful *Subject*: For what more august, more charming and useful, than the *culture* and *preservation* of such goodly *Plantations*.

That shade to our Grand-Children give.

— Seris factura nepotibus umbram.

and afford so sweet, and so agreeable refreshment to our Industrious *Wood-man*.

When He, his wearied Limbs had laid,
Under a florid *Platanus* Shade.

Cum post labores sub *Platano* cubat
Virentis umbra —

Claud.

Or

Or some other goodly spreading *Trees*, such as we told you stopt the *Legions* of a proud *Conquerour*, and that the wise *Socrates* sware by: That *Passenius Crispus* did *Sacrifice* to, and the honours of his Gods.

20. But, whilst we condemn this *Excesse* in them; *Christians*, and true *Philosophers* may be instructed to make use of these *Enjoyments* to better purposes, by contemplating the *Miracles* of their Production and structure: And what *Mortal* is there so perfect an *Atomist*, who will undertake to detect the thousandth part, or poynt of so exile a *Grain*; as that insensible rudiment, or rather *halituous spirit*, which brings forth the lofty *Fir-Tree*, and the spreading *Oake*? That *Trees* of so enormous an height and magnitude, as we find some *Elmes*, *Planes*, and *Cypresses*; some hard as *Iron*, and solid as *Marble* (for such the *Indies* furnish many) should be swaddl'd and involv'd within so small a dimension (if a poynt may be said to have any) without the least luxation, confusion or disorder of Parts, and in so weak and feeble a substance; being at first but a kind of tender *mucilage*, or rather rottenness, which so easily dissolves and corrupts *Substances* so much harder, when they are buried in the moist Womb of the *Earth*, whilst this tender, and flexible as it is, shall be able in time to displace and rent in sunder whole *Rocks* of stones, and sometimes to cleave them beyond the force of *Iron Wedges*, so as even to remove *Mountains*? For thus no *Weights* are observ'd able to suppress the victorious *Palm*; And thus, our *Tree* (like *Man* whose inverted *Symbol* he is) being sown in *corruption*, rises in *glory*, by little and little ascending into an hard erect *Stem* of comely dimensions, into a solid *Tower* as it were; and that which but lately a single *Ant*, would easily have born to his little *Cavern*, now capable of resisting the fury, and braving the Rage of the most impetuous *storms*, *Magni mehercule artificis, clausisse totum in tam exiguo* (to use *Seneca's* expression) & *horror est consideranti.* Epiã. 53.

21. Contemplate we again, What it is which begins this motion or flame, causing it first to radiate in the *Earth*, and then to display its Top in the *Ayre*, so different *Poles* (as I may call them) in such different *Mediums*? How it elects, and then intro-sumes its proper food, and gives suck, as it were, to its yet tender *Infant*, till it have strength and force to prey on, and digest the more solid *Juices* of the *Earth*; for then, and not 'till then, do the *Roots* begin to harden: Consider how it assimilates, separates, and distributes these several supplies; how it concocts, transmutes, augments, produces and nourishes without separation of *Excrements* (at least to us visible) and generates its like, without violation of *Virginity*: By what exquisite percolations, and fermentations it proceeds; for the *Heart*, *Fibers*, *Veins*, *Rind*, *Branches*, *Leaves*, *Blossoms*, *Fruit*; for the strength, Colour, Taste, Odour and other stupendious Qualities, and distinct Faculties, some of them so repugnant and contrary to others; yet in so uniform, and successive a Series, and all this perform'd in the dark, and those secret Recesses of Nature. *Quid*

Foliorum describam diversitates? What shall we say of the *Mysterions* forms, *variety*, and *variegation* of the *Leaves* and *Flowers*, contriv'd with such *Art*, yet without *Art*; some *round*, others *long*, *Oval*, *Multangular*, *indented*, *crisp'd*, *rough*, *smooth* and *polish'd*, *soft* and *flexible* at every tremulous blast, as if it would drop in a moment, and yet so obstinately adhering, as to be able to contest against the fiercest *Winds*, that prostrate mighty Structures, raising *Hurricanes*, the violence whereof whole *Fleets* and *Countries* do often feel; yet I say, continually making War, and sometimes joyn'g Forces with steeming showers, against the poor *Leaf*, tyed on by a slender *stalk*; there it abides 'till *God* bids it fall: For so the wise *Disposer* of Things has plac'd it, not only for *Ornament*, but *use* and *protection* both of *Body* and *Fruit*, from the excessive heat of *Summer*, and *colds* even of the sharpest *Winters*, and their immediate impressions; as we find it in all such *Places* and *Trees*, as like the *bless'd* and *good man*, have always *Fruit* upon them, ripe, or preparing to mature; such as the *Pine*, *Fir*, *Arbutus*, *Orange* and most of those which the *Indies* and more *Southern* Tracts plentifully abound in; where *Nature* provides this continual shelter, and clothes them with perennial Garments.

22. Let us again examine with what care the *Seeds*, those little *Souls* of Plants, *Quorum exilitas* (as one says) *vix locum inveniat* (in which the whole and compleat *Tree*; though invisible to our dull sense, is yet perfectly and intirely wrapp'd up) are preserv'd from *avolation*, diminution and detriment; expos'd, as they seem to be, to all those accidents of *Weather*, *storms* and *rapacious* Birds, in their spinic, arm'd and compacted *Receptacles*; where they sleep as in their *Caufes*, 'till their *Prisons* let them gently fall into the embraces of the *Earth*, now made pregnant with the *Season*, and ready for another *Burthen*: For at the time of *Year* she fails not to bring them forth; and with what delight have I beheld this tender and innumerable Off-spring *repullulating* at the *Feet* of an aged *Tree*! from whence the *Suckers* are drawn, transplanted and educated by humane *Industry*; and forgetting the *ferity* of their *Nature*, become *civiliz'd* to all his *Employments*.

23. Can we look on the prodigious quantity of *Liquor*, which one poor wounded *Birch* will produce in a few *hours*, and not be astonish'd how some *Trees* should in so short a space, *Weep* more than they weigh? and that so dry, so feeble and wretched a *branch* as that which bears the *Grape*, should yield a *Juice* that *Cheers* both *God* and *Man*? That the *Pine*, *Fir*, *Larch*, and other *Resinous* *Trees*, Planted in such rude, and uncultivated places, amongst *Rock*s and dry *Pumices*, should transude into *Terpentine*, and pearl out into *Gums*, and pretious *Balms*?

24. There are ten Thousand Considerations more, besides that of their *Medicinal* and *Sanative* properties, and the *Mechanical* *Uses* mention'd in this *Treatise*, which a *Contemplative* Person may derive from the *Groves* and the *Woods*; all of them the Subject of *Wonder*; And though he had onely the *Palm* or the *Cocco*, which furnishes

furnishes a great Part of the *World* with all that even a *Voluptuous* Man can need, or almost desire, it were sufficient to employ his *Meditations* and his *Hands*, as long as he had to live, though his *years* were as many as the most aged *Oak*: But a *Wise*, and a *Thinking Man* can need none of these *Topics*, in every *Hedge*, and every *Field* they are before him; and yet we do not admire them, because they are *Common*, and *obvious*: Thus we fall into the just *reproach* given by one of the *Philosophers* (introduc'd by the *Oratour*) to those who slighted what they saw *every-day*, because *they every-day saw them*; *Quasi Novitas nos magis quam magnitudo rerum, debeat ad exquirendas causas excitare*: As if *Novelty* onely should be of more force to ingage our enquiry into the *Causes* of Things, than the *Worth* and *Magnitude* of the *Things* themselves.

*Cic. de Nat.
Deor. L. 2.*

Resonate montes Laudationem, SYLVA,

Isa. 44. 23.

Et omne Lignum ejus.

F I N I S.

Page 10

Chapter II

of the

POMONA,
OR AN
APPENDIX
CONCERNING
FRUIT-TREES,
In relation to
CIDER,

The *Making*, and several ways of *Ordering* it.

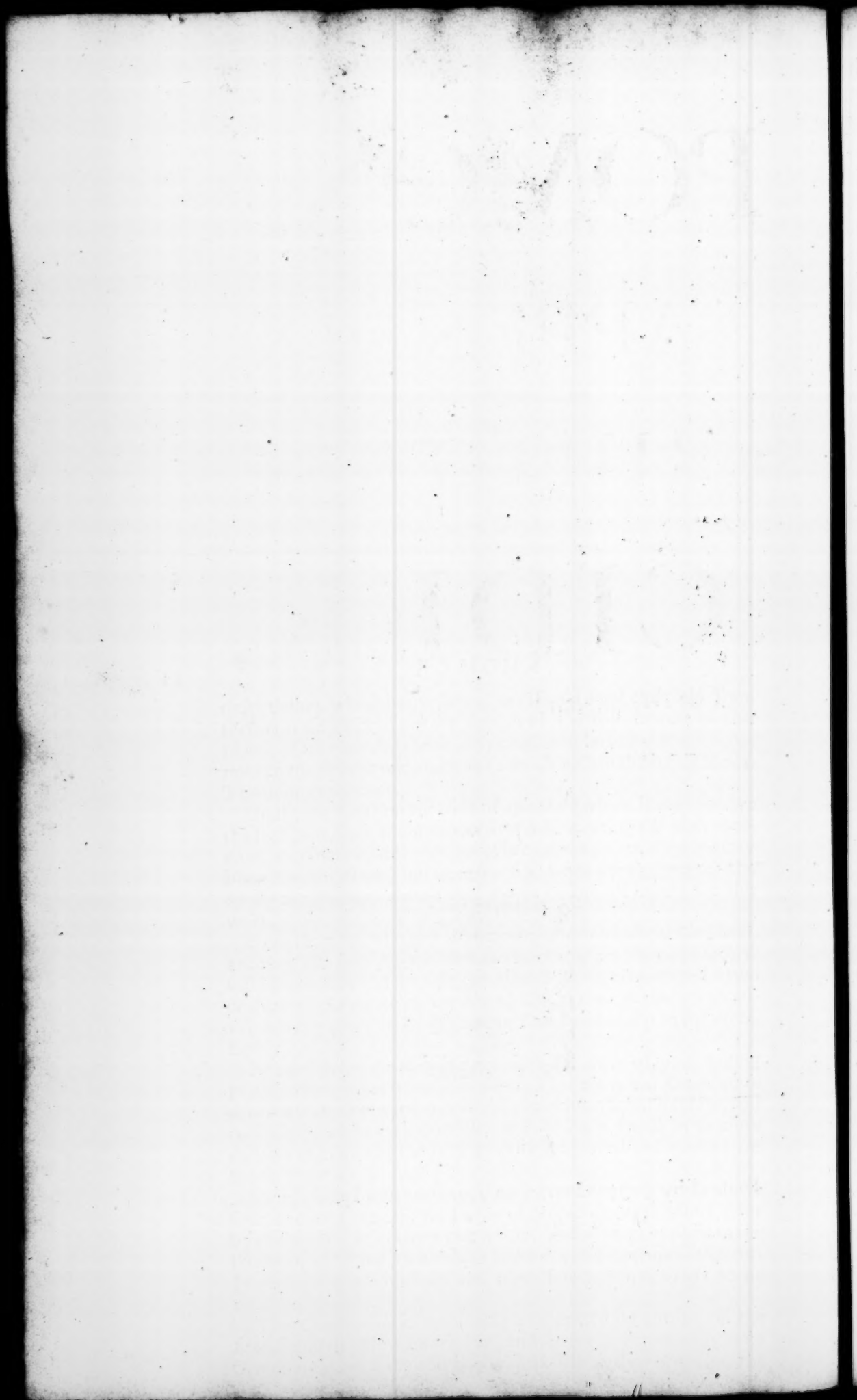
VIRG. Eclog. ix.

—Carpent tua Poma nepotes.



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To the Right Honourable

THOMAS

Earl of *SOUTHAMPTON*,

Lord HIGH TREASURER

O F

ENGLAND, &c.

My Lord,



F great *Examples* did not support it, the dignity and greatness of your *Person* would soon have given cheque to this presumption: But since *Emperours* and *Kings* have not only gratefully accepted *Works* of this nature, but honour'd them likewise with their own sacred hands, that *Name* of yours, (which ought indeed never to appear but on Instruments of *State* and fronts of *Marble*, consecrating your *Wisdom* and *Vertues* to *Eternity*) will be no way lessen'd by giving Patronage to these appendant *Rusticities*. It is from the Protection and Cherishment of such as your *Lordship* is, that these *Endeavours* of ours may hope one day to succeed and be prosperous. The noblest and most useful Structures have laid their Foundations in the *Earth*: if that prove firm *here* (and firm I pronounce it to be, if your *Lordship* favour it) We shall go on and flourish. I speak now in relation to the *Royal Society*, not my self, who am but a *Servant* of it only, and a *Pioner* in the *Works*. But be its fate what it will, Your *Lordship*, who is a *Builder*, and a lover of all *Magnificences*, cannot be displeas'd at these agreeable Accessories

The Epistle Dedicatory.

sories of *Planting*, and of *Gardning*. But, my Lord, I pretend by it yet some farther service to the *State* than that of meerly *profit*, if in contributing to your diversion I provide for the *Publick health*, which is so precious and necessary to it in your excellent *Person*. Vouchsafe *POMONA* your *Lordships* hand to kifs, and the humble *Presenter* of these *Papers* the honour of being esteem'd,

My Lord,

Your most humble, and most

obedient *Servant*

J. EVELYN.

POMONA

P O M O N A,

Or An APPENDIX Concerning

F R U I T - T R E E S,

In relation to

C I D E R:

The Making, and several ways of Ordering it.

THE PREFACE.



At Quercus was the Proverb; and it is now time to walk ^{AN. 1600} out of the Woods into the Fields a little, and to consider <sup>in eos, qui reli-
liſto victu ſor-
dido, ad ele-
gantiorē
lautiorēq;
digrediu-
tur.</sup> what Advancement may be there likewise made by the planting of FRUIT-TREES. For after the Earth is duly cultivated, and pregnant with a Crop of Grain; it is only by the Furniture of ſuch Trees as

bear Fruit, that it becomes capable of any farther Improvement. If then by diſcovering how this may beſt be effected I can but raiſe a worthy emulation in our Country-men; this addition of noble Ornament, as well as of Wealth and Pleaſure, Food and Wine, may (I preſume) obtain ſome grateful admittance amongſt all Promoters of Industry.

But before I proceed, I muſt, and do ingenuouſly acknowledge, that I preſent my Reader here with very little of my own, ſave the pains of collecting and digeſting a few diſpers'd Notes (but ſuch as are to me exceedingly precious) which I have receiv'd; ſome from worthy, and moſt experienc'd * Friends of mine; and others, from the well-fur- niſh'd Registers, and Cimelia of the ROYAL SOCIETY. Eſpecially, thoſe Aphoriſms, and Treatiſes relating to the Hiſtory of Cider, which by expreſs commands they have been pleas'd to injoin I ſhould publiſh with my Sylva.

* Eſpecially, from the moſt excellently learned Dr. Beale of Yeovil in Somerſet ſhire, a Member of the Royal Society.

It is little more than an Age, ſince Hops (rather a Medical, than Alimental Vegetable) tranſmuted our wholeſome Ale into Beer; which doubtleſs much alter'd our Conſtitutions: That one Ingredient (by ſome not unworthily ſuſpect'd) preſerving Drink indeed, and ſo by cuſtom made agreeable; yet repaying the pleaſure with tormenting Diſeaſes, and a ſhorter life, may deſervedly abate our fondneſs to it; eſpecially, if with this be conſider'd likewiſe, the casualties in planting it, as ſeldom ſucceeding more than once in three years; yet requiring conſtant charge and culture; Beſides that it is none of the leaſt devourers of young Timber.

And what if a like care, or indeed one quarter of it, were (for the future) converted to the propagation of Fruit-trees, in all parts of this Nation, as it is already in ſome, for the benefit of Cider? (one Shire

The PREFACE.

alone within twenty miles compass, making no less, yearly, than Fifty thousand Hogsheads) the commutation would (I persuade my self) rob us of no great Advantage; but present us with one of the most delicious and wholesom Beverages in the World.

It was by the plain Industry of one Harris (a Fruiterer to King Henry the Eighth) that the Fields, and Environs of about thirty Towns, in Kent only, were planted with Fruit, to the universal benefit, and general Improvement of that County to this day; as by the noble example of my Lord Scudamor, and of some other publick-spirited Gentlemen in those parts, all Herefordshire is become, in a manner, but one intire Orchard: And when his Majesty shall once be pleas'd, to command the Planting but of some Acres, for the best Cider-fruit, at every of his Royal Mansions, amongst other of his most laudable Magnificences; Noblemen, wealthy Purchasers, and Citizens will (doubtless) follow the Example, till the preference of Cider, wholesom, and more natural Drinks, do quite vanquish Hopps, and banish all other Drogues of that nature.

But this Improvement (say some) would be generally obstructed by the Tenant, and High-shoon-men, who are all for the present profit; their expectations seldom holding out above a year or two at most.

To this 'tis answer'd; That therefore should the Lord of the Mannour not only encourage the Work by his own Example, and by the Applause of such Tenants as can be courted to delight in these kinds of Improvements; but should also oblige them by Covenants to plant certain Proportions of them, and to preserve them being planted.

To fortifie this profitable Design, It were farther to be desir'd, that (if already there be not effectual provision for it, which wants only due execution and quickning) an Act of Parliament might be procur'd for the Setting but of two or three Trees in every Acre of Land that shall hereafter be enclosed, under the Forfeiture of Six-pence per Tree, for some publick and charitable Work, to be levy'd on the Defaulters. To what an innumerable multitude would this, in few years, insensibly mount; affording infinite proportions, and variety of Fruit throughout the Nation, which now takes a Potion for a refreshment, and drinks its very Bread-corn!

I have seen a Calculation of twenty Fruit-trees to every Five-ponnds of yearly Rent; forty to Ten; sixty to Fifteen; eighty to Twenty; and so according to the proportion. Had all our Commons, and Waste-lands one Fruit-tree but at every hundred foot distance, planted, and fenc'd at the publick charge, for the benefit of the Poor, (whatever might dy and miscarry) enough would escape able to maintain a Stock, which would afford them a most incredible relief. And the Hedg-rows, and the Champion-grounds, Land-divisions, Mounds, and Head-lands (where the Plough not coming, 'tis ever abandon'd to VVeeds and Briars) would add yet considerably to these Advantages, without detriment to any man.

As touching the Species, if much have been said to the preference of the Red-strake before other Cider-Apples, this is to be added; That as the best Vines, of richest liquor, and greatest burden, do not spend much in wood and unprofitable branches; so nor does this Tree: for though other Cider may seem more pleasant (since we decline to give Judgment of what is unknown to us) we yet attain our purpose, if This shall appear best

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best to reward the Planter, of any in present practise; especially, for the generality; because it will fit the most parts which are addicted to these Liquors, but miss of the right kinds, and prove the most secure from external injuries and Invaders.

But not to refine any farther upon the rare effects of Cider, which is above all the most eminent, soberly to exhilarate the Spirits of us Hypochondriacal Islanders, and by a specific quality to chase away that unsociable Spleen, without excess; we must not forget that the very Blossom of the Fruit perfumes, and purifies the Ambient Air, which (as Dr Beal well observes in his Hereford-shire Orchards) is conceiv'd conduces so much to the constant Health and Longævity, for which that Country has been always celebrated, fencing their Habitations and sweet Recesses from Winds, and Winter-invasions, the heat of the Sun, and his unsufferable darts: And if (saith he) we may acknowledge grateful trifles, for that they harbour a constant Aviary of sweet Singers, which are here retain'd without the charge of Italian wires: To which I cannot but add his following option, That if at any time we are in danger of being hindered from Trade in Foreign Countries, our English indignation may scorn to feed at their Tables, to drink of their Liquors, or otherwise to borrow or buy of Them, or of any their Confederates, so long as our Native Soyl does supply us with such excellent Necessaries.

Hereford-sh.
Orch. p. 8.

Nor do we produce these Instances to redeem the Liquor from the superstitition, prejudice, and opinions of those Men who so much magnifie the juice of the Grape above it: But we will here add some Experiments from undeniable success (in spite of Vintners, and Bauds to mens Palats) were they sufficient to convince us, and reclaim the vitiated; or that it were possible to dispute of the pleasantness, riches, and præcedency of Drinks and Diets, and so to provide for fit, competent, and impartial Judges; when by Nature, Nation, or Climate (as well as by Custom and Education) we differ in those Extrems.

Most parts of Africa and Asia prefer Coffee before our Noblest Liquors; India, the Roots and Plants before our best Cook'd Venison; Almost all the World crude water, before our Country Ale and Beer; and we English being generally more for insipid, luscious, or gross Diet, than for the spicy, poignant, oylie, and highly relish'd, (witness our universal hatred of Oyls, French-wine, or Rhenish without Sugar; our doating on Currans, Figgs, Plum-pottage, Pies, Pudding, Cake, &c.) renders yet the difficulty more arduous. But to make good the Experiment

About thirty years since one M. Taylor (a person well known in Hereford-shire) challeng'd a London-Vintner (finding him in the Country) That he would produce a Cider which should excel his best Spanish or French-wine: The Wager being deposited, He brings in a good Red-strake to a private House: On that Scene, all the Vintner could call to be Judges pronounce against his Wine; Nor would any man there drink French-wine (without the help of Sugar) nor endure Sack for a full draught; and to those who were not accustomed to either, the more racy Canaries were no more agreeable than Malaga, too luscious for the repetition. But this Wager being lost, our Vintner renews his Chartel, upon these express terms, of Competent and Indifferent Arbitrators: The Gentle-

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man agrees to the Articles; and thus again after mutual engagements it must be debated who were Competent Judges, and absolutely Indifferent. M. Taylor proposes Three, whereof the odd Number should by Vote determine: They must be of the fittest Ages too, or rather the fittest of all Ages, and such as were inur'd neither to Cider nor any Wine; and so it was agreed. The Judges convene; viz. A Youth of ten years old, a Man of thirty, and a Third of sixty; and by All these also our Vintner lost the Battel. But this is not enough; 'Tis asay'd again by Nine Judges, the Ternary thrice over; and there 'tis lost also: To this we could add another, even of the Cider of Ledbury (which is not yet the best of Herefordshire) which, when an experienced London-Vintner had tasted, he wish'd had been Poyson; for that if it were known where he dwelt, it would utterly undo his Trade. And here I will conclude; for I think never was fairer Duel; nor can more be reasonably pretended to vindicate this Blessing of God, and our Native Liquor from their contempt, and to engage our Propagators of it.

To sum up all: If Health be more precious than Opinion, I wish our Admirers of Wines, to the prejudice of Cider, behold but the Cheat themselves; the Sophistications, Transformations, Transmutations, Adulterations, Bastardizings, Brewings, Trickings, not to say, even Arsenical Compassings of this Sophisticated God they adore; and that they had as true an Inspection into those Arcana Lucifera, which the Priests of his Temples (our Vintners in their Taverns) do practise; and then let them drink freely that will; *'Agis deus tuus: ----- Give me good Cider.*

It is noted in our Aphorisms how much this Beverage was esteemed by His late Majesty, and Court, and there referr'd to all the Gentry of the inwironing Country, (no strangers to the best VVines) when for several Summers in the City of Hereford (so encompass'd with store of it, and brought thither without charge, or extraordinary subductions) it was sold for six-pence the VVine-Quart, not for the scarcity, but the excellency of it: And for the Red-strake, that it has been seen there hundreds of times (with vehement and engaged competition) compar'd with the Cider of other the most celebrated Fruit, when after a while of vapour, no man stood for any other Liquor in comparison.

But it is from these Instances (may some say) when the VVorld shall have multiplied Cider-Trees, that it will be time enough to give Instructions for the right Pressing and Preserving of the Liquor. The Objection is fair: But there are already more Persons better furnish'd with Fruit, than with Directions how to use it as they should; when in plentiful years so much Cider is impair'd by the ignorant handling, and becomes dead and sour, that many even surfeit with the Blessing; it being rarely seen in most Countries, that any remains good, to supply the defects of another year; and the Royal Society would prevent all this hazard by this free Anticipation. And yet when all this is said, we undertake not to divine what excellent Cider other soils may bear; nor do we positively extol the Red-strake farther than the bounds and confines of Herefordshire, for the Experiments we have produc'd; but because there are doubtless many such soils sparsedly throughout this Nation; why should it not incite our Industry to its utmost effort, and the

*Tot beneficiis
Placere cogi-
tur, & mira-
mur noxium
esse Vinum?*
Plin.

As 'tis most ingeniously cited by Dr Charleton, in his excellent Discourse of the Adulterations of Wine, entered into the Register of the Royal Society; and (with those other most useful Pieces subjoin'd) worthy to be published, &c. See Register, Ro. Society, Num. 2. 17. Decemb. 28. Jan. 1662. pag. 67. 116. &c.

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the commendable emulation of endeavouring to raise a yet kindlier Cider-fruit if it be possible, and which may prove in it self as good, and as agreeable to the Soil where we plant it? And certainly, much of this may fairly be expected, from the Trials, Culture, and Propagation of Kernel-Fruits of innumerable sorts, and from hopeful VVildings, and the peculiarity of Grounds.

It now remains, that I should make some Apology for my self, to extenuate the tumultuary Method of the ensuing Periods. Indeed it was not intended for a quaint or elaborate piece of Art; nor is it the design of the Royal Society to accumulate Repetitions when they can be avoided; and therefore in an Argument so much beaten as is that of dressing the Seminary, Planting, and modes of Graffing, it has been with Industry avoided; such rude, and imperfect draughts being far better in their esteem (and according to my Lord Bacon's) than such as are adorn'd with more pomp, and ostentous circumstances, for a pretence to Perfection. The Time may come when the richness, and fullness of their Collections may worthily invite some more Industrious Person to accomplish that History of Agriculture, of which these Pieces (like the limbs of Hippolitus) are but scattered parts: And it is their greatest ambition for the Publique Good, to provide such Materials, as may serve to Raise, and Beautifie that most desirable Structure.

EVELYN.

POMONA.

POMONA.

CHAP. I.

Of the Seminary.

WE had not the least intention to enlarge upon this *Title*, after we had well reflected on the many and accurate Directions which are already published, as well in our *French Gardiner*, as in sundry other *Treatises* of that nature, had not a most worthy *Member* of the *Royal Society* (to whom we have infinite Obligations) furnished us with some things very particular and remarkable, in order to the improvement of our *Seminaries*, *Stocks*, &c. which are indeed the very *Basis* and *Foundation* of *Cider-Orchards*. It is from those precious *papers* of his, and of some others (whose Observations also have richly contributed to this *Enterprize*) that we shall chiefly entertain our *Planter* in most of the following Periods.

Dr. Beale of
Yeavil in
Somerset-
shire.

Whosoever expects from the *kernel* of a rich or peculiar *Apple* or *Pear* to raise *Fruit* of the same kind, is likely to find many obstructions and disappointments: For the *Wilding*, (*Crab* or *Pear*) *Pomus Sylvestris*, being at the best the natural product of the soundest *kernel* in the firmest land, and therefore the gust of the *Fruit* more strongly austere, fierce, and sharp, and also the *Fruit* less and more woody; and the pleasanter or plumper and larger *Apple* being the effect of some inteneration, which inclines to a kind of rebatement of the natural strength of the Tree; the best choice of *kernels* for *Stocks* indefinitely, (and on which we may graff what we please) should be from the soundest *Wilding*. For,

A *kernel* taken from any *grafted-Apple*, as *Pepin*, *Pear-main*, &c. does most naturally propend to the wildness of the *Stock* on which 'twas inserted, as being the natural mother of the *kernel*, which is the very heart of the *Apple*; and also from a more deep and secret *Reason*, to be hereafter unfolded.

Apples and *Pears* requiring rather a vulgar and ordinary *Field-land*, than a rich *Garden-mould*, (as has been often seen to succeed by frequent Observations) it has been found that *kernels* sowed in a very high *compost*, and rank earth, have produced (*large* indeed) but *insipid* *Fruit*, hastily rotting on the Trees, before all the parts of it were mature. *Vid. Aphor. 33.*

And sometimes when they seemed in outward figure to bear the shape of *grafted Apples*, from whence the *kernels* came, yet the gust did utterly deceive, wanting that vivacity and pungent agreeableness.

If the *kernels* of natural Apples (or of *ungrafted Trees*) should produce the same, or some other variety of Apples, (as sometimes it succeeds) yet would this care be seldom *operæ pretium*, and at best but a work of *Chance*, the disappointment falling out so often through the fickleness of the *Soil*: Or admit *that* the most proper and constant, yet would the very *dews* and *rain*, by various and mutable Seasons, and even by the *Air* it self, (which operates beyond vulgar perception, in the very changes as well of the *mould*, as of the *seeds* and *fruit*) create almost infinite alterations: And the choice having been in all places (apparently for some *thousands* of years) by propagating the most delicate of *Fruits* by the *Grafts*, 'tis almost a desperate task to attempt the raising of the *like*, or better Fruit from the rudiments of the *Kernel*.

Yet since our design of relieving the want of *Wine*, by a *Succedaneum* of *Cider*, (as lately improv'd) is a kind of *Modern Invention*, We may encourage and commend their patience and diligence who endeavour to raise several kinds of *Wildings* for the tryal of that excellent Liquor; especially since by late experience we have found, that *Wildings* are the more proper *Cider-Fruits*; some of them growing more speedily, bearing sooner, more constantly, and in greater abundance in leaner Land, much fuller of *juice*, and that more masculine, and of a more *Winy* vigour.

Thus the famous *Red-strake* of *Hereford-shire* is a pure *Wilding*, and within the memory of some now living surnamed the *Scudamores Crab*, and then not much known save in the *Neighbourhood*, &c. Yet now it would be difficult to shew that *Red-strake* which grew from a *kernel* in that whole *Tract*, all being since become *grafted Trees*. Thus 'tis also believed, That the *Bromsbury Crab* (which carries the same in some parts of *Glocester-shire*) and many of the *White Musts*, and *Green Musts*, are originally *Savages*; as now in *Somerset-shire* they have a generous *Cider* made of promiscuous *kernels*, or *ungrafted Trees*, which fills their confidence that no other *Cider* does exceed it; and 'tis indeed strong, and of a generous vigour.

Nor dare we positively deny, but that even the best of our *Table-fruit* came also originally from the *kernel*: For it is truly noted by my *L. Bacon*, That the Fruit does generally obey the *Graft*, and yields very little to the *Stock*; yet some little it does:

The famous *Bezy de Hery*, an excellent Musky *Pear*, was brought into the best *Orchards* of *France* from a *Forest* in *Bretainy*, where it grew wild, and was but of late taken notice of.

But now to the deep *Reason* we lately threatned: We have by an Experiment found some neer affinity between the *Kernel* of the *Apple* and the *heart* or interior of the *Stock*: For I saw (says *Dr. Beale*) an old rotten *Kernel-Tree* bearing a delicate *Summer-fruit*, yielding store of smooth *Cider*, ('tis call'd the *French-Kernel-Tree*, and is also a *Dwarf*, as is the *Red-strake*;) and examining divers *Kernels*, many years successively, of that hollow and decayed *Tree*, I found them always very small of growth, and empty, meer skins of *Kernels*, not unlike to the emasculated *Scrotum* of an *Eunuch*; another

ther younger Tree, issuing from the sounder part of a Root of the same old Tree, had full and entire Kernels.

And from some such Observation might the production of *Berberies*, &c. without *Stones*, be happily attempted; an *Instrument* fitted to take out the *marrow* or *pith* of the *Branches*, (as the same *D^r Beale* perform'd it;) for from the *numerical* Bush of that *Fruit* he found some *Branches* produce *Berberies* that had no *stones*, others which had; and in searching for the *cause* of the *effect*, perceived, that the *pith* or *heart* was taken from the *radical*, or main *Branches*, as the other was full of *pith*, and consequently the fruit in perfection; of all which (he writes me word) he made several tryals on other fruit, but left the place before he could see the event. But he adds;

These many years (almost twenty) I have yearly tri'd Kernels in Beds of clean Earth, Pots, and Pans, and by the very leaves (as they appear'd in first springing for one moneth) I could discern how far my Essays had civiliz'd 'em: The Wilder had shorter, stiffer, brown, or fox-colour'd leaves, The more ingenuous had more tender, more spreading leaves; and approaching the lighter verdure of the Berbery leaf when it first appears. He adds,

Some Apples are call'd Rose-Apples, Rosemary-Apples, Gillyflower-Apples, Orange-Apples, with several other adjuncts, denominating them, from what Reason I know not. But if we intended to try such *infusions* upon the *Kernels* (as should endeavour to alter their *kinds*) we should not approve of the bedabbling them with such *infusions*, (for over-moisture would rather enervate than strengthen them) but rather prepare the *Earth* the year before, with such *insuccations*, and then hinder it from producing any *Weeds*, till ready for the *Kernels*, and then in dewy times, and more frequently when our *Climate* were surcharg'd with *rain*, cover the *Beds* and *Pots* with the small leaves of *Rosemary*, *Gillyflowers*, or other beriferous *Blossomes*, and repeat it often, to the end the *dews* may *meteorize*, and emit their finer *Spirits*, &c. Or if any shall please to be so liberal of their *Salts* and *Calcinations* of peculiar *Virtues* (though possibly the *Essay* may indanger their *seeds*) yet the mixture of such *Salts* finely reduc'd and strewed discreetly on their *Beds*, may be a more probable means, than those *Liquid Infusions* which have hitherto been so confidently boasted. For thus also we are in this *Age* of ours provided of more vigorous *Ingredients* for *trials* than were known to the *Ancients*. Finally,

From what has been deduc'd from the *Wilding* of several parts, it may manifestly appear, how much more congenial some *soil* is than other, to yield the best *Cider-fruit* from the *Kernel*; and the *hazze* ground, or quicker mould, much better than the more obstinate *clay* or ranker earth: In hot *Gravelly-Grounds*, where almost no sort of *Fruit* will grow, *Pears* will thrive; and a Friend of mine assures me, of One that clave a *Rock*, and filling it with a little good *Earth*, planted a *Pear-tree* therein, which prosper'd exceedingly: I add this, that none may go hence without encouragement.

CHAP. II.

Of Stocks.

THE former thus establish'd, after all *humours* and *varieties* have been sufficiently wearied, we shall find the *Wilding* to be the hardiest and most proper *Stock* for the most delicate *Fruit*: This confirm'd by *Varro*, lib. 1. cap. 40. *In quacunque; arborem inseras*, &c. and 'tis with reason: However they do in *Herefordshire*, both in practice, and opinion, limit this *Rule*; and to preserve the gust of any delicate *Apple* (as of the *Pear-main*, *Quince-Apple*, *Stockin*, &c.) rather graff upon a *Gennet-Moyle* or *Cydod-din-Stock*, (as there call'd) than a *Crab-Stock*; but then indeed they conclude the *Tree* lasts not so long; and 'tis observ'd, That *Apples* are better tasted from a clean, light land, &c. than from stiffer clay, or the more pinguid and luxurious soil, whence we may expect some assistance from the civility of the *Stock*, which is a kind of prepared *Soil*, or foundation to the *Graff*; even as our very *Transplantations* into better ground is likewise a kind of *Graffing*.

Thus in like manner our Master *Varro*, loco citato concerning *Pears*; *Si in Pyrum Sylvaticam*, &c. The *Wild-stock* does enliven the dull and phlegmatic *Apple*, and the *Stock* of a *Gennet-Moyle* sweeten and improve an *Apple* that seems *over-tart*, as the *Pome-roy*, or some *Greening*, &c. or may rather seem to abate at least some *Apple* *over-tart* and severe.

Your *Crab-stock* would be planted about *October*, at thirty two Foot distance, and not *grafted* till the third *Spring* after, or at least not before the *second*.

But if your design be for *Orchard* only, and where they are to abide, an *interval* of sixteen Foot shall suffice for the *Dwarfish* kind, or in the *Grounds* where the *Red strake*, or other *Fruit-trees* are of small bulk, provided the ground be yearly turn'd up with the *Spade*, and the distance quadrupled where the *Plough* has privilege; this being the most expedite for such as have no *Nursery* ground.

CHAP. III.

Of Graffs and Infitions.

Make choice of your *Graffs* from a constant and well-bearing Branch.

And as the *Stock* hath a more verdant rind, and is capable to yield more plenty of *juice*, so let the *Graff* have more *Eyes* or *Buds*: Ordinarily three or four *Eyes* are sufficient to give issue to the *Sap*; but as well in *Apples*, and *Pears*, as in *Vines*, those *Graffs* or *Cions* are preferr'd in which the *buds* are not too far asunder, or distant from the foot thereof: and such a number of *buds* usually determining the length of the *Graff*, there may divers *Cions* be made of one *Branch*, where you cannot procure plenty of them for severals.

As to the success of *grafting*, the main point is, to joyn the inward rind of the *Cion* to the inward rind of the *Stock*, so that the *sap* of the *One*, may there meet with the *sap* of the *Other*, and these parts should be joyn'd closely, but not too forceably; that being the best and most infallible way, by which most of the quick and juicy parts are mutually united, especially towards the bottom.

If the *Stock* be so big as to endanger the pinching of your *Graff*, when the *wedge* is drawn out of the *cleft*, let the inner side of the *Graff*, which is within the wood of the *Stock*, be left the thicker, that so the *woody* part of the *Cion* may bear the stress, and the *sappy* part be preserved from bruising. Some by an happy-hand, do with good success *Graff* without cleaving the *Stock* at all, only by *Incisions* in the *Rind*, as the *Industrious* Mr. *Austin* teaches us: But since this is not for every *Rustic* hand, nor seems to fortifie so strongly against impetuous *Winds*, before the Union be *secure*, there had need be some extraordinary *defence*.

Choose the straightest and smoothest part of the *Stock* for the place where you intend to *graft*: If the *Stock* be all knotty (which some esteem no impediment) or crooked, rectifie it with the fittest posture of the *Graff*.

For a *Graff* covet not a *Cion* too slender; for the *Sun* and *Wind* will sooner enforce it to wither: Yet are we to distinguish, that for *Inoculation*, we take the *Bud* from a sprig of the last years shoot; and must allow that the *Cions* should also have some of the former with it, that it may be the stronger to *graft*, and abide to be put close into the *Stock*, which is thought to advance it in bearing.

In *Hereford-shire* they do frequently choose a *Graff* of several years growth; and for the *grafting* of such large *Stocks* as are taken out of the *Woods* or *Nurseries*, and fitted into rows for *Orchards*, they choose not the *Graffs* so small as in other Countries they re-

quire them; which has, it seems, occasion'd some complaint from them that understand not the Reason of the first branch of this Note. Once for all, the stumpy *Graff* will be found much superior to the slender one, and make a much nobler and larger Shoot. This upon experience.

Graff your *Cions* on that side of the *Stock* where it may receive the least hurt from the *South-west* Wind, it being the most common, and most violent that blows in *Summer*; so as the *wind* may blow it to the *Stock*, not from it: And when the *Zephyres* of the *Spring* are stirring, choose that *Season* before all others for this work.

Some there are who talk of removing the *Stock* about *Christmas*, and then also graff it; which there be that glory they can successfully do even by the fire side, and so not be forc'd to expect a two or three years rooting of the *Stock*; But in this *Adventure* 'tis advisable to plunge the *Graff* three or four inches deep in the *Stock*. Lastly,

Be careful that the *Rain* get not into the *clefts* of your young grafted *Stocks*: Yet it has been noted, That many old *Trees* (quite decay'd with an inward hollowness) have born as full burdens, and constantly, as the very soundest, and the Fruit found to be more delicate than usually the same kind from a perfect and more entire *Stock*.

Except some former case requires it, leave not your *Graffs* above four, five, or (at most) six inches of length above the *Stock*; for by the length it draws more feebly, and is more expos'd to the shocks of the *Wind*, or hurt by the *Birds*; and you shall frequently perceive the summities and tops of such young *Graffs* to be mortified and die.

The *Genet-moyle* is commonly propagated by cutting off the *Branch* a little below a *Burr-knot*, and setting it without any more Ceremony; but if they be also grafted first as they grow on the *Tree*, and when they have covered the head, cut off below the *Burr*, and set, it is far better: In this separation cut a little beneath the *Burr*, and peel off, or prick the *Bark*, almost to the *knot*: Thus also if the *Branch* have more *knots* than one, you may graff, and cut off yearly, till within half a foot of the very *stem*, which you may graff likewise, and so let stand.

Now for encouragement in transporting *Graffs* at great distance, we find that with little care (their tops uncut and unbruised) they will hold good, and may support the transportation by *Sea* or *Land* from *October* or *November* to the very end of *March*: See *Sir H. Plat's Offers*, Paragr. 75. To which may be added, That if the *Graff* receives no hurt by lying in the *Stock* expos'd to all rain, dews, and severities of *Winter* frosts from *December* to *Spring*, (as has been experimentally noted); then (by a stronger presumption) in oyled, or rather waxen Leather, it may undoubtedly escape. Some prescribe, That the ends shall be stuck in a *Turnip*: and many excellent *Graffers* (*Gentlemen* some of very good credit) have assured us, That the *Graffs* which seemed withered, and fit

to be cast away, have proved the best when tri'd. Thus in honest *Barnaby Googes* noble *Heresbachius* you will find it commended to gather your *Gions* in the *wane* of the *Moon*, at least ten days before you *graft* them; and *Constantine* gives this reason for it, That the *Graft* a little withered, and thirsty, may be the better received of the *Stock*: I know some who keep them in *Earth*, from the end of *October*, till the *Spring*, and will hardly use them before. There are also other inducements for this practice, as *Simon Harwood*, pag. 4. has shew'd us; but none beyond our own experience, who have known *Grafts* gathered in *December* thrive and do perfectly well.

The best expedient to convey *Grafts* is to stick the *cut-ends* in *Clay*, envelop'd with a *clout* to preserve it from falling off; and to wrap the other part of the *Twigs* in dry *Hay* or *straw-bands*, which will secure them both from the *Winds*, *Galling*, and other injuries in *Transportation*: Nay, I have known them sent many *hundred Miles* from beyond the *Seas* accommodated to an ordinary *Letter*, and though somewhat short, and with very few *Buds*, yet with excellent success; and if this course were more universally consider'd, we might be furnish'd with many great *Curiosities* with little difficulty or charge.

CHAP. IV.

Of Variety and Improvements.

IF any man would have *variety* of unexpected and unknown *Apples* and *Pears*, for the improvement of *Cider*, or *Palate-fruit*, there is more hope from *Kernels* rais'd in the *Nursery* (as has already been directed) than from such tryals of *graftings* as we have yet seen in present use.

But if we would recover the patience, and the sedulity of the *Antient* (of which some brief account will follow) or listen to some unusual Proposals, then may we undertake for some variety by *Insitions*.

To delude none with Promises, we do much rather recommend the diligence of enquiring from all *Countries* the best *Grafts* of such *Fruits* as are already found excellent for the purpose we design: As from the *Turgovians* for that *Pear* of which *Dr. Pell* gives so good and weighty informations; and of which I had presented me some *Grafts*, together with a taste of the most superlative *Perry* the *World* certainly produces; both which were brought near 800 *Miles*, without suffering the least diminution of Excellency, by my Worthy Friend Mr. *Hake* a Member of the *R. Society*, in the year 1666, and tasting as high, and as rich as ever to the present year I am writing this *Paragraph*.

But as some sorts are to be enquired after for the *Palate* and the *Table*,

Table, so 'tis now our main business to search after such as are excellent for their *Liquor*, either as more *pleasant*, more *winy*, or more *lasting*; of which sort the *Bosbury* bare-land-Pear excels. The *Red strake*, *Brombury-Crab*, and that other much celebrated *Wilding* call'd the *Oaken-pin*, as the best for *Cider*; though for sufficient reasons we do yet prefer the *Red strake*, to oblige the *emulation* of other *Countries*, 'till they find out a *Fruit* which shall excell it, and which we do most heartily wish.

But to pursue the diligence of the *Antients*, we direct the eye to a general expedient for all kinde of *varieties* imaginable, and which we hold far better than to present the World with a *List* of the particulars either known, or experimented: For who indeed but a *Fool* will dare to tell *Wonders* in this severe *Age*, and upon an *Argument* which is so environ'd with *Imposture* in most *Writers* old or new? Much less pretend to *Experiments* which may fail to succeed by default of an unhappy *occasion*, when the *conclusion* must be *Penes Authorem sit fides*!

And truly men receive no small discouragement from the ugly affronts of *Clowns*, and less cultivated persons, who laugh and scorn at every thing which is above their understanding: For example; *I knew a man* (writes Dr. Beale to me) *and he a most diligent Planter and Grafter, who for thirty or forty years made innumerable Effays to produce some change of an Apple by Grafting: It seems he was ambitious to leave his Name on such a Fruit, if he could have obtained it; but always fail'd; for he perpetually made his Trials upon Crab-stocks, or such (at least) as did not greatly differ from the kind; and he ever found that the Graff would predominate.* And how infinitely such Men having lost their own aims, will despise better Advice, we leave to observation.

However, let us add, That where nothing is more facile than to raise new kinds of *Apples* (*in infinitum*) from *Kernels*: Yet in that *Apple-Country* (so much addicted to *Orchards*) we could never encounter more than *two* or *three* persons that did believe it: But in other places we meet with many that, on the other side, repute *Wildings*, or (as they call them) *Kernel-fruit*, at all adventure, and without choice, to be the very best of *Cider-fruit*, and to make the most noble *Liquor*. So much does the common judgment differ in several *Countries*, though at no considerable distance, even in *matters* of visible *Fact*, and *epidemical* experience.

It has been soberly affirmed, that by *grafting* any *White Apple* upon an *Elm*, it changes the *Apple*, and particularly to a *red* colour: I have a *Direction* where we may be eye-witnesses of the proof; whatever the Truth of it be, we are not over-hastily to erect *Hercules's Pillars*; but rather to encourage the *Experiment*.

To gratifie yet the *Ingenious*, instruct others, and emancipate us all from these *bastinado-Clowns*, we are furnish'd with many *Arguments* and proofs to assure a good success, at least for *variety* and *change*, if not for infinite choice: Two or three antient *References* being duly præmis'd; namely, First,

I. That

1. That 'tis in vain to expect change of Apples from *Grafting* upon differing *Stocks* of *Crabs* or *Apples*.

2. In vain also are we to look for a kind Tree from a very much differing *Stock*; as an altered *Pear* to grow kindly on a *Crab* or *Apple-stock*, & *contra*. There go about indeed some jugglings, but we disdain to name them.

It is one thing to find the kindest *Stock* for the Improvement of any Fruit; as the *Crab-stock* for the delicate Apple, the *Wild* or *Black-Cherry-stock*, for the grafts of the fairest *Cherries*; the largest *Vine*, (whose root makes best shift for relief) to accept the *Graft* of the more delicate *Vine*; the *White Pear-Plum Stock*, for the *Abri-cot*, &c. And another thing it is to seek the *Stock* which begets the wonder, variety, and that same transcendent and particular excellency we inquire after: For this must be at more remote distance; and we offer from the *Ancients* to shew, how it may be at any distance whatsoever: But the whole expedient seems to be hinted by Sir H. Plat, pag. 72. where he affirms, that *If two Trees grow together, that be apt to be grafted one into another, then let one branch into another, workmanly joyning Sap to Sap*. This our *Gardeners* call *Grafting by Approach*, and is explicated at large by *Columella*.

But in this express *Rule* he is too narrow for our purpose, and far short of old experience; as we find in *Parag.* 63. where he affirms, *We may not graft a contrary Fruit thereon*. Against this we urge; That any contrary *Fruit* may be adventured, and any *Fruit* upon any fruitless *Stock* growing in propinquity in the same *Nursery*; as it is not only affirm'd, but seriously undertaken, and experimentally proved by the sober *Columella*, in several of his *Treatises*; Turn to the eleventh Chapter of his fifth Book, (*Stephens* Edition:) *Sed cum antiqui negaverint posse omne genus surculorum in omnem Arborem inseri, & illam quasi finitionem, qua nos paulo ante usi sumus, veluti quandam legem sanxerint, eos tantum surculos posse coalescere, qui sint cortice, ac libro, & fructu consimiles iis arboribus quibus inseruntur, existimavimus errorem hujus opinionis discutiendum, tradendamque posteris rationem, qua possit omne genus surculi omni generi Arboris inseri*. And the example follows in a *Graft* of an *Olive* into a *Fig-stock* by *Approach* (as we call it,) which he also repeats in the twenty seventh Chapter of his Book *De Arboribus*, without altering a syllable. But possibly in this check at the *Ancient* he might aim at old *Varro*, whom we find threatening no less than *Thunderbolts* and *Blasts* to those who should attempt these strange *Marriages*, and did not fort the *Graft* with the *Tree*; consult *lib.* 1. *cap.* 40. And yet you may see this *Art* assum'd by *Columella* for his own invention (1500 years since) to be no news to *Varro* 200 years older; where he goes on, *Est altera species ex arbore in arborem inserendi nuper animadversa in arboribus propinquis, &c.* Though here again we may question our *Masters* *nuper animadversa* too; since before he was born *Cato* relates it as usual to *Graft* *Vines* in the manner by them prescribed, *cap.* 41. *Terttia insitio est: Terebra vitem quam inseres, &c.* Which by the way makes us admire how the witty *Walchius* in his Discourse *De vitibus*

vitibus fructuariis, pag. 265. could recount the *grafting of Vines* amongst the wonders of *Modern Inventions*.

But it seems *Varro* and his *Contemporaries* did extend the practice beyond *Cato*; and *Columella* proceeded further than *Varro*, even to all sorts of *Trees*, however differing in nature, quality, bark, or season: And then *Palladius* assumes the result, and gives us the particulars of the success in his *Poem, De Inſitionibus*. And to these four as in chief (no phantastical or counterfeit persons) we refer the *Industrious*:

But be pleas'd to take this note also: As soon as your *Graff* hath attained to a *second*, or at farthest a *third* years growth, take it off the *Stock*, and then graff it upon a *Stock* of a more *natural* kind: For in our own *Trials* we have found a *graft* prosper the second year exceeding well; yet the third the whole growth at once blasted quite to the very *Stock*, as if *Varro's* *Augurs* had said the word.

To this add, the making use of such *Stocks* as in this *Experiment* may contribute some special aid to several kinds of humane *Infirmities*: As suppose the *Birch Tree* for the *Stone*, the *Elm* for *Fevers*, &c. For 'tis evident, that by such *Inſitions*, the *Branch* may convert the *Sap* of the *Root* even of another *species* into its own nature, and alter all its *properties*; though in some they *dominere*, as the *Branch* of the *Apple* in the *Rhamnus*, or *Mezerea*, acquires a *Purgative* quality. And by these means why may not the *Fruit* by effectual *Marriages* be rendred *Cordial*, *Astringent*, *Purgative*, *Sudorific*, *Soporiferous*, and even *Deliterious* and *Mortal*: But this we only hint.

Moreover, To *graft* rather the *Wilding*, or *Crab*, than the *Pepin*, because the *Wilding* is the more *natural*; and *Nature* does more delight in *progreſs*, than to be *Retrograde* and go backwards.

I should also expect far more advance from a more *pungent sap*, than from *Inſpid*; as generally we see the best and vigorous *juices* to salute our *Palats* with a more agreeable *piquancy* and tartness; for so we find the relish of the *Stocking-Apple*, *Golden Pepin*, *Pearmain*, *Eliot*, *Harvy*, and all (both *Ruſſetings* and *Greenings*) to be more poignant than of others.

And here we note from *Palladius*, That the *Ancients* had the success which we all, and particularly *Sir H. Plat*, does so frequently deny, as in the particular of *grafting* the *Apple* on the *Pear*, & *contra*. Let us hear him *de Pomo*.

The *Grafted-Crab* its bushy Head does rear,
Much *Meliorating* the inserted *Pear*:
Its self to leave its *Wildness* does invite,
And in a *Nobler issue* to delight.

*Inſita proceris pergit concreſcere ramis,
Et ſociam mutat malus amica Pyrum:*

Séque

*Sæque feros sylvis hortatur linquere mores,
Et partu gaudet nobiliore frui.*

Pallad. de Inſitionib. lib. 14.

But poſſibly *Palladius* alluſion'd this *Poetical* expreſſion, upon preſumption, that no man in his days durſt degrade the moſt excellent *Quince* to ſupport the *Cyon* of another *Fruit*, which then muſt be of leſs eſteem, but we by our *Luxury* have found the ſucceſs.

And we have good argument to believe, That *Virgil*, and *Columnella*, in ſeveral of their wonderful Relations of theſe kinds of mixture, (which but for the prolixity we might now recite) did not ſo far affect *Wonders* as to deſert the truth.

You may alſo obſerve, That as well the *French Gardiner*, and our *Modern Planters*, have found the ſame benefit from the *Stock* of the *Quince*, as old *Palladius* did, it ſeems, acknowledge; yet (as he conceiv'd) more hofpitable ſtill with its own kindred, and that

Though the *Quince-stock* admit all other *Fruit*,
Its *Cyon* with no other *stock* will ſuit :
Scorning the *Bark* of Foreign Trees, does know
Such lovely *Fruit* on no mean *ſtem* can grow :
But the *Quince-Graff*, to the *Quince-stock* is joyn'd;
Contented only to improve its kind.

*Cum præſtet cunctis ſe ſulva cydonia pomis,
Alterius nullo creditur hoſpitio.
Roboris externi librum aſpernata ſuperbit,
Scit tantum nullo creſcere poſſe decus:
Sed propriis pandens cognata cubilia ramis,
Stat, contenta ſuum nobilitare bonum.*

Pallad. de Malo Cydonio.

Laſtly, We did by unexpected chance find the facility of graffing the very youngſt *Stocks*, even of one years growth, by the *Root*: At a ſecond removal of the *Stocks* (being then of two years growth) we obſerved ſome *Roots* ſo faſt cloſed together into one, as not to be divorced: Hereupon we concluded, If caſualty, or negligence, chance of ſpade, or oppreſſion of neighbourhood did this, by *Art* it might be done more effectually, and poſſibly to ſome deſirable purpoſe; for that then the *stock* was more apt to receive a maſtering *Impreſſion*; and any *Garden Plant* whatſoever might by this *proceſs* interchange and mingle their *Roots*. But this can extend no farther than the *Stock* may prevail with the *Graff*.

And thus we have preſented our diligent *Cideriſt* with what Obſervations and Arguments of Encouragement, grounded on frequent *Experience*, we have received from our moſt ingenious *Correſpondents*, eſpecially the Learned and truly Candid *D^r Beale*, in whole *Perſon* we have ſo long entertain'd you: and to theſe we could addundry others, were it not now time (whiles we diſcourſe

of possibilities) to conclude with something *certain*, and to speak of what we have.

For the kinds then of *Cider-Apples* in being; *Glocester-shire* affects the *Bromsbury Crab*; It affords a smart, winy *Liquor*, and is peculiarly hardy, but not so proper for a cold and late-bearing *Climate*, it being not ripe in *hot Land* till the end of *Autumn*, nor fit to be ground for *Cider* till *Christmas*, lying so long in heaps and preparation.

It is in the same *Shire* that they likewise much esteem of the *white* and *red Must-Apple*, the sweetest as well as sowrest *Pepin*, and the *Harvy-Apple*, which (being boyl'd) some prefer to the very best of all *Ciders*; though from any experience we have yet seen, we cannot recommend it, and it will want more particular and infallible *Directions* before we can be reconciled to the *Adventure*, which we have observed so frequently to miscarry.

But about *London*, and the more Southern *Tracts*, the *Pepin*, and especially the *Golden*, is esteemed for the making of the most delicious of that *Liquor*, most wholesom, and most restorative; and indeed it may (in my poor judgment) challenge those *perfections* with very good reason.

By others the *Pearmain* alone is thought to come in competition with the best; but, say they, the *Cider* is for the most part found of the weakest, unless encourag'd with some agreeable *Pepin* to inspirit it; whereas *this* is to be taken according to the constitution of the *Fruit*; for even *Pepins* do differ as much from *Pepins* in *Tast* and *Liquor*, as the *Kind*, and the *Soil* dispose them; nay, though of the same *Species*; so as the *Cider* of the *Pearmain* (though likewise very different) does not seldom exceed it in that briskness which others attribute to the *Pepin*, which is for the most part more smooth and less *poinant*: I conceive a good way of extracting the *Spirits* of these *Fruits*, might prove a likely *Criterion* to ground our judgments on in all these niceties; whilst by the way, we may note, that of all *Apples*, that bear one general Name, the *Pepin* seems the most to differ; and the *Cider* from the genuine *Cider-Fruit*, keeps nearest to the same strength and relish.

Some commend the *Fox-Whelp*; and the *Gennet-Moyle* was once prefer'd to the very *Red-strake*, and before the *Bromsbury-Crab*; but upon more mature consideration, the very *Criticks* themselves now *Recant*, as being too effeminate and soft for a *judicious* *Palate*.

The *Red-strake* then amongst these accurate *Tasters* hath obtained the absolute præminence of all other *Cider-fruit*, especially in
 See Aph. 42, *Hereford-shire*, as being the richest and most *vinous* *Liquor*, and
 45, 37. now with the more earnestness commended to our practice, for its celerity in becoming an *Orchard*, being ordinarily as full of *Fruit* at *ten* years growth as other *Trees* are at *twenty*; the *Pepin* or *Pearmain* at *thirty*: And lastly, from that no contemptible quality, That though the smiles of it intice even on the *Tree*, as being indeed better than most other *Table-fruits* whilst hanging, yet it needs

needs no *Priapus* for Protector, since (as beautiful as 'tis) it has no such temptation to the *Tast*, 'till it be either *baked*, or converted into *Cider*. The same may be affirmed also of the *Broms-berry-Crab*, *Bareland-Pear*, and many other *Wildings*, who are no less at their *Self-defence*; yet the *Gennet-Moyle* at due *maturity*, has both a gentle, and agreeable relish; their unagreeableness to the *Palate* (as else-where noted) proceeding only from the separation the *juice* makes from the *Pulp*, which even *Children* do remedy by *contusing* them on their sharpened Elbows; which (if thoroughly weigh'd) seems to *dispute*, if not *overthrow* some *Hypotheses* of *Fermentation*.

In sum, The *Red-strake* will at three years *grafting* give you fair hopes, and last almost an hundred years; if from sundry mens *Experience* of more than 60 years, we may divine, and that it agree with the *Soyl*. And the *Gennet-Moyles* hasten to an *Orchard* for *Cider* without trouble of *Art* or *Grafting*: But note, That this *Tree* is very apt to contract a *bur-knot* near its *Trunk*, where it begins to divide; and being cut off under that *boss*, commonly grows (if so set) and becomes speedily a *Tree*, except it encounter an extraordinary dry *Summer* the first year to give it check. And though the knack of *grafting* be so obvious, yet this more appearing facility does so please the lazy *Clowns*, that in some places they neither have nor desire any other *Orchards*; and how this humour prevails you may perceive by the hasty progress of our *Kentish Codlin* in most parts of *England*. But this hasty growth and maturity of the *Tree* is by another *Instance* confirm'd to us from that worthy *Gent.* Mr. *Blount* of *Orleton*, who writes me word, that some of the rejected *Spray*, or *Prunings* of the *Gennet-Moyle*, taken by chance to *rice* a *Plot* of *Pease* (though stuck into the *Earth* but at *April*) put forth root, grew, blossom'd, and bore *Apples* the same year.

See C. Taylor's Discourse of Cider.

But to advance again our *Red-strake*, even above the *Pepin*, and the rest (besides the celerity of the improvement and constant burthen) consider we the most incredible product, since we may expect from each *Apple* more than double the quantity; so as in the same *Orchard*, under the same *culture*, thirty *Red-strake Trees* shall at ten years *grafting* yield more *Cider* than a *hundred* of those *Pepins*, and surmount them in proportion during their period at least sixty or seventy years: So that granting the *Cider* of the *Golden-Pepin* should excel, (which with some is precarious) yet 'tis in no wise proper for a *Cider-Orchard*, according to our general design, not by half so soon bearing, nor so constantly, nor in that quantity, nor *fulness* or *security*.

Concerning *Perry*, the *Horse-Pear* and *Bare-land-Pear* are reputed of the best, as bearing almost their weight of spritful and *vinous Liquor*. The Experienced prefer the *tawny* or *ruddy* sort, Aph. 43. as the colour of all other most proper for *Perry*: They will grow Aph. 34. in *common-fields*, *gravelly*, *wild*, and *stony* ground, to that largeness, as one only *Tree* has been usually known to make three or four *Hogheads*: That of *Bosbury*, and some others, are so tart and

harsh that there is nothing more safe from plunder, when even a *Swine* will not take them in his mouth. But thus likewise would the abundance preserve these Fruits, as we see it does in *Nor-mandy*.

CHAP. V.

Of the Place and Order.

WE do seriously prefer a very wild *Orchard*, as mainly intended for the publick utility, and to our purpose of obliging the *People*, as with a speedy *Plantation* yielding store for *Cider*: Upon this it is that we do so frequently inculcate, how well they thrive upon *Arable*, whilst the continuing it so accelerates the growth in almost half the time: And if the *Arable* can be so levell'd (as commonly we see it for *Barly-land*) then without detriment it may assume the Ornament of *Cyrrus*, and flourish in the *Quinchux*.

If it be *shallow Land*, or must be rais'd with high *Ridges*, then 'tis necessary to have more regard of planting on the *tops* of those eminencies, and to excuse the unavoydable breach of the *decussis*, as my Lord *Verulam* excuseth the defect of our humane *phanties* in the *Constellations*, which obey the *Omnipotent* order rather than ours: Add to this the rigour of the *Royal Society*, which approves more of *plainness* and *usefulness*, than of *niceness* and *curiosity*; whiles many putting themselves to the vast charge of levelling their grounds, oftentimes make them but the worse; since where the places are full of gasty inequalities, there may be planted some sorts of *Cider fruit*, which is apt by the great burden to be press'd down to the ground, and there (whiles it hides *Irregularities*) to bear much better, and abundantly beyond belief; for so have been seen many such recumbent *Pear-trees* bear each of them *two, three, yea, even to six* or more *Hogheads* yearly.

And for this *Cider*, whiles we prefer some sorts of *Wildings* which do not tempt the *palate* of a *Thief*, by the caution we shall not provoke any man to repent his charge from the necessity of richer and more reserv'd *Enclosures*; Though we have frequently seen divers *Orchards* successfully planted on very poor *Arable*, and even in stony *Gleab*, *gravel* and *clay*, and that pretty high, on the sides and declivities of *Hills*, where it only bears very short grass, like to the most ordinary *Common*, not worth the charge of *Tillage*: And yet even there the *Tenants* and *Confiners* sometimes enclose it for the *Fruit*, and find their reward, though not equally to such *Orchards* as are planted on better ground, and in the *Vallies*. Hence we suggest, That if there be no *Statute* for it, 'twere to be wished there were a *Law* which should allow *endeavours* of this nature out of the *Common-field*, to enclose for these *Encouragements*,
since

since both the *Publick* and the *Poor* (whatever the clamour is) are advantaged by such *Enclosures*, as *Tusser* in his old Rhimes, and all indifferent observers apprehend with good reason.

True indeed it is, That all Land is not fit for *Orcharding*, so as even where to form just *Inclosures* being either too shallow and dry, or too wet and sterving: But this (saith the judicious Mr *Buckland*) we may aver, That there are few Parishes, or Hamlets in England where there are not some fat and deep Headlands capable of Rows of Trees; and that (as hath been said) the raised Banks of all *Inclosures* generally by the advantage of the depth, fatness, and health of their Mould, yield ready opportunity for planting; (yea, and in many Countrys multitudes of Crab-stocks fit to be grafted;) in which latter (saith he) I have frequently observed very goodly Fruit-bearing Trees, when in the same soil Trees in Orchards have been poor and worth nothing. To conclude,

If the soil be very bad and unkind, any other Fruit (which it may more freely yield without requiring much depth, and less Sun) may be planted instead of Apples.

CHAP. VI.

Of Transplanting, and Distance.

THe most proper season for *Transplanting* is before the hard Frosts of *Winter* surprize you, and that is a competent while before *Christmas*: And the main point is, to see that the *Roots* be larger than the *Head*; and the more ways that extends, the better and firmer.

If the *Stock* seems able to stand on its own three or four legs (as we may call 'em,) and then after settlement some stones be heaped or laid about it, as it were gently wedging it fast, and safe from Winds (which stones may after the second or third year be removed) it will save from the main danger: For if the *Roots* be much shaken the first *Spring*, it will hardly recover it.

You may transplant a *Fruit-Tree* almost at any tolerable season of the Year, especially if you apprehend it may be spent before you have finish'd your work, having many to remove: Thus, let your *Trees* be taken up about *Allhallontide*, (or as soon as the leaf begins to fall); then having trimm'd and quickned the *Roots*, set them in a *Pit*, forty, fifty, or a hundred together, yet so as they may be covered with mould, and kept very fresh: By the *Spring* they will be found well cured of their wounds, and so ready to strike root and put forth, that being *Transplanted* where they are to stand, they will take suddenly, and seldom fail; whereas being thus cut at *Spring* they recover with greater hazard.

The very *Roots* of *Trees* planted in the ground, and buried within a quarter of an Inch, or little more, of the level of the *Bed*, will sprout, and grow to be very good *Stocks*. This and the other

other being Experiments of our own, we thought convenient to mention.

By the oft removal of a *Wild-stock*, cutting the ends of the *Roots*, and dis-branching somewhat of the *Head* at every change of place, it will greatly abate of its natural wildness, and in time bring forth more *civil* and *ingenuous* Fruit: Thus *Gillyflowers* do (by oft removals, and at *full-Moon* especially) increate and multiply the leaves.

Plant not too deep; for the *over-turf* is always richer than the *next* Mould. How material it is to keep the *coast* or side of the *Stock*, as well in *Fruit-trees* as in *Forest*, we have sufficiently discuss'd; nor is the Negative to be prov'd.

See *Aph.* 35. For the *distance* in *Fields*, they may be set from *thirty two* to *sixty* Foot, so as not to hinder the *Plough*, nor the benefit of manure and soil; but in *hedg-rows* as much nearer as you please, Sun and Air considered.

CHAP. VII.

Of the Fencing.

Seeing a *Cider-Orchard* is but a wild Plantation, best in *Arable* well enclos'd from *Beasts*, and yet better on the *Tops*, *Ridges*, and natural *Inequalities*, (though with some loss of *Order*, as we shew'd,) one of the greatest discouragements is the *preserving* of our *Trees* being planted, the raising of them so familiar.

We have in our *Sylva* treated in particular of this, as of one of the most material *obstacles*; wherein yet we did purposely omit one *Expedient*, which came then to our hands from the very Industrious Mr. *Buckland* to the Learned Dr. *Beal*: You shall have it in his own words.

This of Fencing *single Trees* useth to be done by *Rails* at great charges; or by *Hedges* and *Bushes*, which every other year must be renewed, and the materials not to be had in all places neither. I therefore prefer and commend to you the ensuing form of Planting and Fencing, which is more cheap and easie, and which hath other Advantages in it, and not commonly known. I never saw it but once, and that imperfectly perform'd; but have practis'd it my self with success: Take it thus.

Set your Tree on the *Green-swarth*, or five or six inches under it if the soil be very healthy; if moist or weeping, half a foot above it; then cut a Trench round that Tree, two foot or more in the cleare from it: Lay a rank of the *Turfs*, with the *grass* outward, upon the inner side of the Trench towards your Plant, and then a second rank upon the former, and so a third, and fourth, all orderly plac'd, (as in a Fortification) and leaning towards the Tree, after the form of a *Pyramide*, or larger *Hop-hill*: Always as you place a row of *Turfs*
in

in compass, you must fill up the inner part of the Circle with the loose Earth of the second spit which you dig out of your Trench, and which is to be two foot and half wide, or more, as you desire to mount the hillock, which by this means you will have rais'd about your Plant near three foot in height. At the point it needs not be above two foot or eighteen inches diametre, where you may leave the Earth in form of a Dish, to convey the Rain towards the body of the Tree; and upon the top of this hillock prick up five or six small Briars or Thorns, binding them lightly to the body of the Plant, and you have finish'd the work.

The commodities of this kind of Planting are,

First, Neither Swine, nor Sheep, nor any other sort of Cattel can annoy your Trees.

Secondly, You may adventure to set the smaller Plants, being thus raised, and secur'd from the reach of Cattel.

Thirdly, Your Trees fasten in the Hillock against violence of Winds, without Stakes to fret and canker them.

Fourthly, If the soil be wet, it is hereby made healthy.

Fifthly, If very dry, the hillock defends from the outward heat.

Sixthly, It prevents the Couch-grass, which for the first years insensibly robs most plants in sandy grounds apt to graze. And,

Lastly, The grazing bank will recompence the nigardly Farmer for the waste of his Ditch, which otherwise he will sorely bethink.

In the second or third year (by what time your Roots spread) the Trench, if the Ground be moist, or Seasons wet, will be neer fill'd up again by the treading of Cattel; for it need not be cleans'd; but then you must renew your Thorns: Yet if the Planter be curious, I should advise a casting of some small quantity of rich Mould into the bottom of the Trench the second year, which may improve the growth, and invite the Roots to spread.

In this manner of Planting, where the soil is not rich, the exact Planter should add a little quantity to each Root of Earth from a frequented High-way, or Yard where Cattel are kept; One Load will suffice for six or seven Trees; this being much more proper than rotted soil or loose Earth; the fat Mould best agreeing with the Apple Tree.

The broader and deeper your Ditch is, the higher will be your Bank, and the securer your Fence; but then you must add some good Earth in the second year, as before.

I must subjoyn, That only Trees of an upright growth be thus planted in open grounds; because spreading of low growing Trees will be still within reach of Cattel as they increase: Nor have I met with any inconvenience in this kind of Transplanting (which is applicable to all sorts of Trees) but that the Mole and the Ant may find ready entertainment the first year, and sometime impairs a weak rooted Plant; otherwise it rarely miscarries. In sum,

This manner of Fencing is soon executed by an indifferent Workman, who will easily set and guard six Trees in a Winter day. Thus far Mr. Buckland: To which we shall only add, That those which are planted in the Hedg-rows need none of these defences; for (I

am

P O M O N A :

am told) in *Hereford-shire* in the Plantations of their *Quick-fets*, or any other, all men did so *superstitiously* place a *Crab-stock* at every *twenty foot* distance, as if they had been under some rigorous *Statute* requiring it; and I am of Opinion, that 'twere better to be content with *Fruit* in the bordering *Mounds*, than to be at all this trouble to raise *Tumps*, or temporary banks in the midst of an *Inclosure*; or if *Pears* will thrive in the Plain of the *Ortyard*, as we frequently see them, (where neither *Apple* or other *Fruit* could in appearance be expected) then *Crabs*, which may be raised on the *Mounds*, will kindly mix the *Liquor* into very good *Beverage*.

CH A P. VIII.

Of Pruning and Use of the Fruit-Trees.

THe *Branches* are to be lopp'd in proportion to the bruises of the *Roots*, whose *fibres* else should only be quickned, not altogether cut off nor intangled: For the *Top*, let a little of each arm be lopp'd in *Cider-fruit* only; but for the *Pears*, cut two or three *buds* deep at the summities of their aspiring *Branches*, just above the *eye* slanting; this will keep them from over-hasty mounting, reduce them into *shape*, and accelerate their *bearing*.

To this we add again out of Dr. Beals *Herefordshire Orchards*, pag. 23. In a grafted plant every *Bough* should be topped at the very *tops*, in Apples and Pears, as in Cherries and Plums, if Transplanted without violation of *Roots*, which only indeed renders it less necessary.

In most kinds of natural Plants the Boughs should not at all be lopped, but some taken off close to the Trunk, that the Root at first Transplantation be not engaged to maintain too many Suckers, this to be understood, though of such as grow naturally from the *Kernel*, or the *Bur-knot*; especially if removed after they are well rooted. And this must be done with such discretion, that the *Top-branches* be not too close together; for the natural Plant is apt to grow *spiry*, and thereby fails of fruitfulness. Therefore let the reserved *Branches* be divided at a convenient roundness.

The *Branches* of those we call natural Plants (for usually the Grafted generally fail) that are cut off, may be set, and will grow, though slowly.

If the *Top* prove *spiry*, or the fruit unkind, then the due remedy must be in re-graffing. See Chap. xxviii. in *Sylva*.

Besides the *Perrys*, dri'd and preserv'd *Fruit*, useful is the *Pear-Tree* (and best the most barren, or *Pig-taile*, as they call it, which is the *Wild Pyrafter*) for its excellent colour'd *Timber*, hard and levigable (seldom or not ordinarily worm-eaten) especially for
Stools;

Stools, Tables, Chairs, Pistol-Stocks, Instrument-Maker, Cabinets, *and very many works of the Joyner, (who can make it easily to counterfeit Ebony) and Sculptor, either for flat, or emboss'd-Works, and to Engrave upon, because the Grain intercepts not the Tool. And so is likewise both the Black-Cherry (especially for the Necks of Musical-Instruments) and the Plum-Tree.*

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ANIMAD-

The following is a list of the names of the persons who have been admitted to the membership of the Society since the last meeting of the Executive Committee. The names are given in alphabetical order of their surnames.

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ANIMADVERSION.

I*F some of the following Discourses seem less constant, or (upon occasion) repugnant to one another, they are to be consider'd as relating only to the several gusts, and guizes of Persons and Countries, and not to be looked upon as recommended Secrets, much less impos'd, farther than upon Tryal they may prove grateful to the Publick, and the different inclinations of those who affect these Drinks: nor in reason ought any to decry what is propos'd for the universal Benefit; since it costs them nothing but their civility to so many obliging Persons.*

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OF
THE
REVEREND
FATHER
JOHN
BAPTIST
MURPHY
OF
THE
SACRAMENT
OF
THE
Eucharist
IN
THE
CITY
OF
NEW
YORK
IN
THE
YEAR
OF
OUR
LORD
1844

GENERAL ADVERTISEMENTS CONCERNING CIDER:

By D^r *B E A L E*.

1. **H**E that would treat exactly of *Cider* and *Perry*, must lay his foundation so deep as to begin with the *Soyl*: For as no Culture or Grass will exalt the *French Wines* to compare with the *Wines of Greece*, *Canaries*, and *Montefiasco*; so neither will the *Cider of Bromyard* and *Ledbury* equal that of *Ham lacy*, and *Kings-Capell*, in the same small County of *Hereford*.

2. Yet the choice of the *Graff* or *Fruit* hath so much of prevalence, that the *Red-strake-Cider* will every where excel common *Cider*, as the *Grape of Frontignac*, *Canary*, or *Baccharach*, excels the common *French Grape*; at least, till by time and traduction it degenerateth.

3. I cannot divine what *Soil* or what *Fruit* would yield the best *Cider*; or, how excellent *Cider* or *Perry* might be if all *Soils* in common and all *Fruit* were tried; but for *thirty years* I have tried all sorts of *Cider* in *Hereford-shire*, and for three years I have tried the best *Cider* in *Somerset-shire*; and for some years I have had the best *Cider* of *Kent* and *Essex* at my call; yet hitherto I have always found the *Cider* of *Hereford-shire* the best, and so adjudged by all good *Palates*. But I shall rejoice to be better informed, and truly from all other *Countries*; and do both wish and hope, that in a short time, we shall every where be rich in many *Improvements*.

4. I cannot undertake to particularize all kind of *Soil*, no more than to compute how many *Syllables* may be drawn from the *Alphabet*; the number of *Alphabetical Elements* being better known than the *Ingredients* and *Particles* of *Soil*, as *Chalk*, *Clay*, *Gravel*, *Sand*, *Marle*, (the tenaciousness, colour, and innumerable other qualities, shewing endless diversities;) and the *Fruit* of *Crabs*, *Apples*, and *Pears*, being as various as of *Grapes*, *Figs*, and *Plums*.

5. Yet in gross, this I note; That as *Bacchus amat colles*, and a light ground, so our best *Cider* comes from the hot *Rie-Lands*: In fat *Wheat-Land* it is more sluggish; and in white, stiff *Clay-Land* (as in *Woolhope* in *Hereford-shire*) the common *Cider* retains a thick

thick whey-colour, and not good: Only such as riseth there (by the diligence or some *Art* of the *Inhabitants*) is bright and clear, and so lively, that they are apt to challenge the best.

6. Some *Cider* mixeth kindly with *Water* in the *Cider-mill*, and will hold out a good small *Wine*, and less inflaming, all the following *Summer*. Some *Cider* (as of *Long-hope*, a kind of four *Wood-Land* Country of *Herefordshire*) will not bear any mixture of *Water*, but soon decay, and turn more harsh and sour: And thus we noted in *France*, some coarse *Wines* stuck like paint in the *Glass*, unwilling to incorporate with the *Water*: *Vind' Aye*, and other delicate *Wines*, did spread themselves more freely, as *gold* is more *ductile* than baser *metals*.

7. Some would, for a fit, extol the *Cider* of *Pearmains*, some of *Pepins*; (and of *Pepins* I have found a congenial *Liquor*, less afflicting *Splenetic* persons, as in mine own experience I conceived:) And Sir *Henry Lingen* once extolled the *Cider* of *Eleots* (as richly bedewing the *Glass* like the best *Canaries*;) and full *Hogsheds* of the *Stocking-Apple* have been tried amongst us, but disappointing our expectation, though perhaps by evil ordering: Yet Mr. *Gritten* highly boasted a Mixture of *Stocking-Apples* and *May-Pears*, tried (as I take it) by himself: After many years trial of those and many other kinds, the *Red-strake* carried the common fame, and from most of those reduced admirers: The *Gennet-moyl Cider* was indeed more acceptable to tender *Palats*; and it will require *Custom* and *Judgment* to understand the preferency of the *Red-strake*, whose mordicant sweetness most agreeably gives the farewell, endearing the relish to all flagrant *Palats*; which both obliges, whets, and sharpens the *stomach* with its masculine and *winy* vigour; and many thousands extol it for exceeding the ordinary *French-Wine*: But grant it should not be so strong as *Wine*; let me ask how many sober persons abroad addict themselves to meer *Wine*? Then compare *this* with diluted *Wine*, as usually for temperate men, and then let the trial be made, whether the *Pepin-Cider* or *Red-strake* will retain the *winy* vigour in greater proportion of *Water*. Add to this, That they commonly mingle *Water* in the *Press* with *Apples* (a good quantity) whiles they grinde the *Apple*; and the *Water* thus mixed, at that time, does so pleasingly incorporate in the grinding, fermentation, and maturity of *Vesseling*, that 'tis quite another and far more pleasant thing than if so much or half so much *Water* were mingled in the *Cup* at the drinking time; as *Salt* on the *Trencher* will not give *Beef*, *Pork*, or *Neats-Tongue*, half that same relish which duly *powder'd* and timely season'd.

8. I did once prefer the *Gennet-moyl Cider*, but had only the *Ladies* on my side, as gentler for their sugary *palats*, and for one or two sober draughts; but I saw cause to recant, and to confess the *Red-strake* to warm and whet the *Stomach*, either for *meat* or more *drink*.

9. The right *Cider-fruit* is far more *succulent*, and the *Liquor* more easily divides from the *pulpe* of the *Apple*, than in best *Table-fruit*,

fruit, in which the juice and the pulp seem friendly to dissolve together on the tongues end.

10. The Liquor of best *Cider-fruit* in the *Apple*, in best season of ripeness, is more brisk and smart than that which proves duller *Cider*: And generally the fiercest *Pears*, and a kind of tamer *Crabs*, (and such was the *Red-strake* called in my memory) makes the more winy *Cider*.

11. *Palladius* denieth *Perry* to bear the heat of *Summer*; but there is a *Pear* in *Bosbury*, and that Neighbourhood, which yields the *Liquor* richer the *second* year than the *first*, and so by my experience very much amended the *third* year: They talk much higher; but that's beyond my account.

12. As *Cider* is for some time a sluggard, so by like care it may be retained to keep the *Memorials* of many *Consuls*; and these smoaky bottles are the *nappy Wine*. My Lord *Scudamore* seldom fails of three or four years; and he is nobly liberal to offer the *Trial*.

13. As *red Apples*, so *red Pears* (and amongst them the red *Hors-pear* next to the *Bosbury*) have held out best for the stomach and durance: But *Pears* do less gratifie the stomach than *Apples*.

14. The season of *grinding* these *harsh Pears* is after a full maturity, not till they have dropt from the Tree, and there lain under the Tree, or in heaps, a *week*, or thereabouts.

15. And so of *Cider-Apples*, as of *Grapes*, they require full maturity, which is best known by their natural *fragrancy*; and then also, as ripe *Grapes* require a few mellowing days, so do all *Apples*, as about a week or little more, so they be not bruised, which soon turns to rottenness; and better sound from the Tree than rotten from the heap; though yet the juice of *Apples* and *Pears* (yea, of *Cherrys* or *Grapes*) is not altogether destroy'd, or quite putrified, as soon as the *Pulp* seems to be *corrupted*; neither haply needs there such curiosity, to cull and pick them so accurately, as some prescribe, though doubtless the cleaner, and less contaminated, the better.

16. That due maturity, and some rest on the heap, does make the *Liquor* taste rather of *Apples* than *winy*, hath no more truth, (if the *Cider* be kept to fit age) than that very *old Cheese* doth taste of a *Posset*.

17. The harsher the *wild-fruit* is, the longer it must lye on heaps; for of the same fruit, suddenly ground, I have tasted good *Ver juice*; being on heaps till near *Christmas*, all good-fellows called it *Rhenish wine*.

18. The *Grinding* is somewhat considerable, rather too much than too little; here I saw a *Mill* in *Somersetshire* which grinds half a *Hoghead* at a *grist*, and so much the better ground for the frequent rolling.

19. * Soon after *grinding* it should be *prest*, and immediately be put into the *Vessel*, that it may ferment before the *spirits* be diffused; and then also in fermenting time the *Vent-hole* should not

* See for This, excellent directions in Mr. Newburghs preserving of the surface; C. Taylors Vessel, and Dr Smiths closing be of it up.

be so wide as to allow a prodigal waste of the *spirits*; and as soon as the ferment begins to allay, the *Vessels* should be filled of the same, and well stopped.

20. Of late 'tis much commended, that before it be *prest* the *Liquor* and *Must* should for four and twenty hours ferment together in a *Vat* for that purpose, covered, as *Ale* or *Beer* in the *Test-vat*, and then tunned up. This is said to enrich the liquor, and to give it somewhat of the *tincture* of some *red Apples*, as I have seen, and very well approved.

21. As *Sulphur* hath some use in *Wines*, so some do lay *Brimstone* on a *ragge*, and by a *wire* let it down into the *Cider-Vessel* and there fire it; and when the *Vessel* is full of the *smoak*, the liquor speedily pouted in ferments the better. I cannot condemn this, for *Sulphur* is more kind to the *Lungs* than *Cider*, and the impurity will be discharged in the ferment.

22. *Apples* over-long hoarded before *grinding* will for a long time hold the liquor *thick*; and this liquor will be both pleasant, and as I think, wholesome; and we see some rich *Wines* of the later *Vintage*, and from *Greece*, retain a like crassitude, and they are both *meat* and *drink*.

23. I have seen thick harsh *Cider* the second *summer* become clear and very richly pleasant; but I never saw clear *acid Cider* recover.

24. *Wheat* or *Leven* is good and kind in *Cider*, as in *Beer*; *Juniper-berries* agree well and friendly for *Coughs*, weak *Lungs*, and the aged, but not at first for every *Palate*: The most infallible and undiscerned improver, is *Mustard* a *Pint* to each *Hogshead*, bruised, as for sauce, with a mixture of the same *Cider*, and applied as soon as the *Vessel* is to be closed after fermenting.

25. *Bottling* is the next improver, and proper for *Cider*; some put two or three *Raisins* into every *Bottle*, which is to seek aid from the *Vine*. Here in *Somersetshire* I have seen as much as a *Wal nut* of *Sugar*, not without cause, used for this Country *Cider*.

26. *Crabs* do not hasten the decay of *Perry*, but preserve it, as *Salt* preserves *flesh*. But *Pears* and *Crabs* being of a thousand kinds require more *Aphorisms*; this only I would *Note*, that *Land* which refuses *Apples*, is generally civil to *Pears*, and *Crabs* mingled with them, make a rich and wholesome *Cider*, and has sometimes challenged even the best *Red-Strake*.

27. Neither *Wheat*, *Leven*, *Sulphur*, nor *Mustard*, are used but by very few; and therefore are not necessary to make *Cider* last well, for two, three, or four years.

28. The time of drawing *Cider* into *Bottles* is best in *March*, it being then clarified by the *Winter*, and free from the heat of the *Sun*.

29. In drawing, the best is neerest the *heart* or middle of the *Vessel*, as the *Telk* in the *EGGE*.

30. *Red-strakes* are of divers kinds, but the name is in *Herefordshire* appropriated to one kind, which is fair and large, of a high purple colour, the smell *Aromatical*, the *Tree* a very *shrub*,
soon

soon bearing a full burden, and seldom or never failing till it decays, which is much sooner than other *Apple-trees*. 'Tis lately spread all over *Hereford-shire*; and he that computes speedy return, and true *Wine*, will think of no other *Cider-Apple*, till a better be found.

31. I said the *Red strake* is a small shrub, 'tis of small growth where the *Cider* proves richest, for ought we have yet seen in *Herefordshire*, viz. in light quick land; and if the land be very dry, jejune and shallow, that and other *Cider-fruit* (especially the *Genet-moyle*) will suspend the store of fruit alternatively every other year; except some *Blasts* or surprising *Frosts* in the *Spring* alter that *Method*; for two bad years seldom come together, very hardly three.

32. In good soil, I mean of common field (for fat land is not best for *Cider-fruit*, but common arable) I have seen the *Trees* of good growth, almost equalling other *Cider-trees*; the *Apple* larger and seldom failing of a good burthen: thus in the *Vales* of *Wheat-lands*, in strong *Glebe* or *Clay*, where the *Cider* is not so much extolled: but still *Sack* is *Sack*, and *Canary* differs from *Claret*; so does the *Red-strake-Cider* of the *Vale* excell any other *Cider* of the foresaid soil, such as is already celebrated for its kindness to good *Cider*.

33. Yet this distinction of *Soil* requires much experience, and great heed, if we insist upon accurate directions; for as *Lauremberg* saith, *in pingui solo non seruntur omnia recte, neq. in macro nibil*. And for *Gardens*, *Flowers*, and *Orchards*, I would chuse many times such lands as do not please the *Husbandman*, either for *Wheat* or sweet *Pasture*, which are his chief aims; and thus *Lauremberg*, *In Arida & tenui terra felicius proveniunt Ruta, Allium, Petroselinum, Crocus, Hyssopus, Capparis, Lupini, Satureia, Thymus; Arborea quoq. tenue & macilentum solum amant; itemq. frutices pleriq.* Hujusmodi arbores sunt, *Pomus, Pyrus, Cerasus, Prunus, Persica, Cotonea, Morus, Juglans, Corylus, Staphylodendrum, Mespilus, Ornus, Castanea, &c. Frutices, scil. Vitis, Berberis, Genista, Juniperus, Oxyacantha, Periclymenum, Rosa, Ribesum, Uva, Spina, Vaccinia, &c.*

34. But here also we must distinguish, that *Pears* will bear in a very *stony, hungry, gravelly-land*, such as *Apples* will not bear in; and I have seen *Pears* bear in a tough binding hungry *Clay*, when *Apples* could not so well bear it (as the smooth rinds of the *Pear-trees*, and the *Mossie* and cankered rinds of the *Apple trees* did prove) the root of a *Pear-tree* being it seems more able to pierce a stony and stiff ground. And *Cherries*, *Mulberries* and *Plums* can rejoyce in a richer soil, though by the smallness of the *Roots*, the shallower soil will suffice them. And the *Quinces* require a deeper ground, and will bear with some degrees of hungry land, if they be supplied with a due measure of succulency, and neighbouring moisture; and the other shrubs, according to the smallness of their roots, do generally bear a thinner land. I have seen a soil so much too rank for *Apples* and *Plums*, that all their fruits from year to year were
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Concerning Cider.

always worm-eaten, till their lives were forfeited to the fire.

35. To take up from these *Curiosities*, the most useful result to our purpose; we have always found these *Orchards* to grow best, last longest, and bear most, which are frequently tilled for *Barley*, *Wheat*, or other *Corn*, and kept (by *Culture* and seasonable rest) in due strength to bear a full crop. And therefore, whereas the *Red-strake* might otherwise without much injury be planted at fifteen or twenty foot distance, and the best distance for other *Cider-fruit* hath heretofore been reputed thirty, or two and thirty foot; very good husbands do now allow in their largest *Inclosures* (as of 20, 40 or 100 Acres) fifty or sixty foot distance, that the *Trees* may not much hinder the *Plow*, and yet receive the benefit of *Compost*; and a *Horse-teem* well governed will (without any damage or danger) plow close to the *Trees*.

36. In such soil as is here required, namely of good *Tillage*, an Orchard of grafted *Red-brakes* will be of good growth, and good burthen, within ten or twelve years, and branch out with good store to begin an encouragement at three years *grafting*; and (except the land be very unkind) will not yield to any decay within sixty or eighty years, which is a mans age.

37. In some sheets I rendred many Reasons against Mr. *Austin* of *Oxford*, why we should prefer a peculiar *Cider-fruit*, which in *Heresfordshire* are generally called *Musts*; (so we name both the *Apple* and the *Liquor*, and *Pulpe* as mingled together in the confusion) as from the Latine *Mustum*. *White-Musts* of divers kinds, *Red-cheek'd* and *Red-strak'd Musts* of several kinds, *Green-Musts* called also *Green-fillet*, and *Blew-spotted*: Why, I say, we should prefer them for *Cider*, before *Table-fruit*, as *Pepins*, *Pearmains*, &c. And I do still insist on them: 1. The *Liquor* of these *Cider-fruits* and of many kinds of austere fruit, which are no better than a sort of full succulent *Crabs*, is more sprightly, brisk and *winy*. For Essay, I sent up many bottles to *London*, that did me no discredit. Secondly, One bushel of the *Cider-fruit* yields twice or thrice as much liquor. Thirdly, The *Tree* grows more in three or four years than the other in ten years, as I oft times remarked. Fourthly, The *Tree* bears far greater store, and doth more generally escape *Blasts* and *Frosts* of the *Spring*. I might add, that some of these, and especially such *Pears* as yield the best *Perry*, will best escape the hand of the *Thief*, and may be trusted in the open field.

38. By the first, second and fourth of these Reasons, I must exclude the *Gennet-Moyle* from a right *Cider fruit*, it being dry and very apt to take frosty blasts; yet it is no *Table-fruit*, but properly a baking fruit, as the ruddy colour from the *Oven* shews.

39. I said that the right *Cider-fruit* generally called *Musts*, and deserving the Latine name *Mustum*, is of divers kinds; and I have need to note more expressly that there is a *Red-strak'd Must* (as I have often seen) but not generally known, that is quite differing from the famous *Red-strake*, being much less, somewhat oblong and like some of the white *Musts* in shape, and full of a very good *winy liquor*. I could willingly name the persons and place where the

the distinct kinds are best known: it was first shewed me by *John Nash* of *Ashperton* in *Herefordshire*; and for some years they did in some places distinguish a *Red-Strake*, as yielding a richer *Red-strak'd Cider* of a more *fulvous* or *ruddy* colour; but this difference, as far as I could find, is but a choice of a better *insolated* or *ruddy* fruit of the best kind, as taken from the *South* part of the *Tree*, or from a *soil* that renders them richer. But my Lord *Scudamore's* is safely of the best sort; and *M. Whingate* of the *Grange* in *Dimoc*, and some of *King's-capel*, do best know these and other differences, *Straked-Must*, *right Red-Strake*, *Red-Red-Strake*, &c.

40. The greenish *Must*, (formerly called in the *Language* of the *Country*, the *Green-fillet*) when the *Liquor* is of a kindly ripeness, retains a *greeness* equal to the *Rhenish-glass*; which I note for them that conceive no *Cider* to be fit for use till it be of the *colour* of *old Sack*.

41. To direct a little more *caution*, for enquiry of the right *Red-Strake*, I should give notice that some *Moneths* ago, *M. Philips* of *Mountague* in *Somersetshire*, shewed me a very fair large *Red-Strake Apple*, that by smell and sight seemed to me and to another of *Herefordshire* then with me to be the best *Red-Strake*; but when we did cut it, and taste it, we both denied it to be *right* (the other with much more confidence than my self) but *M. Philips* making *Cider* of it, this week invited me to it, assuring that already it equals or resembles *High-country-wines*. It had not such plenty of juice as our *Red-Strakes* with us, and it had more of the pleasantness of *Table-fruit*, which might be occasioned, for ought I know, by the purer and quicker soil. This *Apple* is here call'd *Meriot-Tynot*, and great store of them are at *Meriot*, a *Village* not far distant: Possibly, this *Meriot* may prove to be the *Red-Strake* of *Somersetshire*, when they shall please to try it apart with equal diligence and constancy as they do in *Herefordshire*: This fruit is of a very lovely *hue*, and by some conceived to be of Affinity to the *Red-Jersey-Apple*, which is reported to *tinge* so deeply: In truth, there can hardly be a deeper *Purple*, than is our right *Herefordshire Red-Strake*, having a few *streaks* towards the *Eye*, of a dark colour, or *Orange-tawny* intermingled: But, 'tis no wonder if an *Apple* should change its *Name* in travelling so far beyond the *Severn*, when even in this *Country*, most sorts of *Apples*, and especially, *Cider-fruit*, loseth the *Name* in the next *Village*.

42. I may now ask why we should talk of other *Cider-fruit* or *Perry*, if the best *Red-Strake* have all the aforesaid pre-eminencies of richer and more *winy* liquor, by half sooner an *Orchard*, more constantly bearing, &c. An *Orchard* of *Red-Strakes* is commonly as full of fruit at *ten* years, as other *Cider-fruit* at *twenty* years, or as the *Pepin* and *Pearmain* at *thirty* or thereabout.

43. To this may be Answered, that all *soils* bear not *Apples*, and to some *soils* other *Apples* may be more kind, and if we be driven to *Perry*, much we may say both in behalf of the *Perry*, and of the *Pear*; of the *fruit*, and of the *Tree*; It is the goodlier *Tree* for a *Grove*, to shelter a house and walks from *Summers heat* and *Win-*

ters cold Winds, and far more lasting; the pleasantest Cider-pear of a known name amongst them, is the *Horse-pear*. And it is much argued, whether the *White-horse-pear*, or the *Red-horse-pear* be the better; where both are best, within two Miles they differ in judgment. The Pear bears almost its weight of sprightly *winy Liquor*; and I always preferred the *tawny* or *ruddy Horse-pear*, and generally that colour in all Pears that are proper for Perry.

44. I rejected *Palladius* against the durableness of Perry; his words are, *Hyeme durat, sed prima acescit æstate*, Tit. 25. Febr. possibly so of common Pears, and in hotter Countries; but from good Cellars I have tasted a very brisk lively and *winy liquor* of these *Horse-pears* during the end of Summer; and a *Bosbury-pear* I have named and often tried, which without bottling, in common *Hogsheds* of vulgar and indifferent Cellars, proves as well pleasanter as richer the second year, and yet also better the third year. A very honest, worthy and witty Gentleman of that neighbourhood would engage to me, that in good Cellars, and in careful custody, it passeth any account of decay, and may be heightened to a kind of *Aqua-vitæ*. I take the information worthy the style of our modern improvements.

The Pear-tree grows in common fields and wild stony ground, to the largeness of bearing one, two, three or four *Hogsheds* each year.

45. This *Bosbury-tree*, and such generally that bear the most lasting *Liquor* and *winy*, is of such unsufferable taste, that hungry Swine will not smell to it; or if hunger tempt them to taste, at first crush they shake it out of their mouths; (I say not this of the *Horse-pear*) and the Clowns call other Pears, of best *Liquor*, *Choak-pears*, and will offer money to such as dare adventure to taste them, for their sport; and their mouths will be more stupified than at the root of *Wake-robin*.

46. A row of *Crab-trees* will give an improvement to any kind of Perry; and since Pears and Crabs may be of as many kinds as there are kernels, or different kinds or mixtures of soils; in a general Character I would prefer the largest and fullest of all austere juices.

47. M. Lill of *Mark-hill* (aged about 90 years) ever observed this Rule, to graff no wild Pear-tree till he saw the fruit; if it proved large, juicy, and brisk, it failed not of good *Liquor*. But I see cause to say, that to graff a young tree with a riper graff, and known excellency, is a sure gain and hastens the return.

48. M. Speke (last high Sheriff of *Somersetshire*) shewed me in his Park some store of *Crab-trees*, of such huge Bulk, that in this fertile year he offered a wager, that they would yield one or two *Hogsheds* of *Liquor* each of them; yet were they small dry Crabs.

49. I have seen several sorts of Crabs (which are the natural Apple, or at worst but the *wild-Apple*) which are as large as many sorts of Apples, and the *Liquor* *winy*.

50. I have disclaimed the Gust of *Juniper-berries* in Cider; I tried

tried it only *once* for *myself*, and drank it before *Christmas*: possibly in more time the relish had been subdued or improved, as of *Hops* in *stale Beer*, and of *Rennet* in good *Parmasan*. Neither was the *Gust* to me otherwise unpleasant than as *Anise-seeds* in *Bread*, rather *strange* than *odious*; and by custom made grateful, and it did halt the *clarification*, and increase the briskness to an endless *sparkling*: thus it indulgeth the *Lungs*, and nothing more *cheap*; where *Juniper* grows a *Girl* may speedily fill her lap with the *Berries*.

If *Barbados* *Ginger* be good, cheaper, and a more pleasant preserver of *Beer*, it must probably be most kind for *Cider*: For first, of all the improvers that I could name, bruised *Mustard* was the best; and this *Ginger* hath the same quick, mordicant vigour, in a more noble and more *Aromaticque* fragrancy. Secondly, *Cider* (as I oft complain) is of a sluggish and somewhat windy nature; and for some *Months* the best of it is chain'd up with a cold *ligature*, as we fancy the fire to be lock'd up in a cold *Flint*. This will relieve the *prisoner*. And thirdly, will assist the *winy* vigour for them that would use it instead of a sparkling *VVine*. Fourthly, 'Tis a good sign of much kindness, and great friendship: it will both enliven the *ferment* for speedier maturity, and also hold it out for more duration, both which offices it performs in *Beer*.

51. *Cider* being *windy* before maturity, some that must not wait the leisure of best *Season* do put sprigs of *Rose-mary* and *Bays* in the *Vessel*; the first good for the *head*, and not unpleasant; the second, an *Antidote* against *Infections*; but less pleasant till time hath incorporated the *Tastes*.

52. And why may we not make mention of all these *Mixtures*, as well as the *Ancients* of their *Vinum Marrubii*, *Vinum Abrotonites*, *Absynthites*, *Hyssopites*, *Marathites*, *Thymites*, *Cydonites*, *Myrtites*, *Scillites*, *Violaceum*, *Sorbi*, &c.

53. And, for *mixtures*, I think we may challenge the *Ancients*, in naming the *Red-raspy*; of which there is in this County a *Lady* that makes a *Bonella*, the best of *Summer drinks*. And more yet if we name the *Clove-july-flower*, or other *July-flowers*, a most grateful *Cordial*, as it is infused by a *Lady* in *Staffordshire*, of the Family of the *Devereux's*, and by some *Ladies* of this Country.

54. I could also give some account of *Cherry-wine*, and *Wine* of *Plums*; the last of which (in the best Essay that I have yet seen) is hardly worthy to be named: But, I conceive, and have ground for it, that some good *Liquor* and *Spirits* may be drawn from some sorts of them, and in *quantity*: And the vast store of *Cherrys* in some places, under a *peny* the *pound*, and of *Plums* that bend the *Trees* with their *burdens*, and their expedite growth makes it cheap enough, and as in the other, so in these, the large *English* or *Dutch* sharp *Cherry*, makes the *Cherry-wine*, and the full black, tawny *Plum*, as big as a *Walnut* (not the kind of *Heart-Cherrys*, nor the *Plum* which divides from the *stone*) make the *Wine*. Their cheapness should recommend them to more general use at *Tables*, when dried like *Prunellas* (an easie art) and then wholesomer.

55. To

55. To return for *Red-strake*; 'tis a good drink as soon as well fermented, or within a *Moneth*, better after some *Frosts*, and when clarified; rich *Wine*, when it takes the colour of old *Sack*. In a good *Cellar* it improves in *Hogsheds* the second year; in *Bottles* and *sandy Cellars* keeps the *Records* of late revolutions and old *Majoralties*. *Quare* the manner of laying them up in *sand-houses*.

56. I tried some *Bottles* all a *Summer* in the bottom of a *Fountain*; and I prefer that way where it may be had. And 'tis somewhat strange if the Land be neither dry for a *sand-house*, nor *fountains* for this better expedient. When *Cider* is settl'd, and altogether, or almost clarifi'd, then to make it *sprightly* and *winy*, it should be drawn into well cork'd and well bound *bottles*, and kept some time in *sand* or water; the longer the better, if the kind be good. And *Cider* being preserved to due age, bottl'd (and kept in cool places, *conservatories*, and *refrigerating* springs) it does almost by time turn to *Aqua-vitæ*; the *Bottles* smoak at the opening, and it catches flame speedily, and will burn like *spirit* of *VVine*, with a fiery taste; and it is a laudable way of trying the vigour of *Cider* by its promptness to burn, and take fire, and from the quantity of *Aqua-vitæ* which it yields. *Cider* affords by way of *Distillation*, an incomparable and useful *Spirit*, and that in such plenty, as from four *Quarts*, a full *Pint* has been extracted.

57. I must not prescribe to other *Palats*, by asserting to what degree of *Perfection* good *Cider* may be raised, or to compare it with *VVines*: But when the late *King* (of blessed memory) came to *Hereford* in his distress, and such of the *Gentry* of *VVorcestershire* as were brought thither as *Prisoners*; both *King*, *Nobility*, and *Gentry*, did prefer it before the best *VVines* those parts afforded; and to my knowledge that *Cider* had no kind of *Mixture*. Generally all the *Gentry* of *Herefordshire* do abhor all mixtures.

Yet if any man have a desire to try *conclusions*, and by an harmless *Art* to convert *Cider* into *Canary-wine*; let the *Cider* be of the former year, *Masculine* and in full body, yet pleasant and well tasted: into such *Cider* put a spoonful, or so, of the *spirit* of *Clary*, it will have so much of the race of *Canary*, as may deceive some who pretend they have discerning *Palats*.

Sir P A U L N E I L's
 DISCOURSE
 O F
 CIDER.

My Lord,



No obedience to the *Commands* of this Honourable Society, I have at length endeavoured to give this brief *Account* of that little which I know concerning the *Ordering* of *Ciders*; and in *that* I shall propound to my self *six* things.

First, To shew that *Cider* made of the best *Eating-apples* must needs be *once* the best; (that is to say) the pleasantest *Cider*.

Secondly, That hitherto the general opinion hath been otherwise, and that the reason of that mistake was the not apprehending the true cause why the *Pepin-cider*, &c. did not retain its sweetness, when the *Hard-apple-cider* did.

Thirdly, What is the true cause that *Pepin-cider*, used in the ordinary method, will not retain its sweetness.

Fourthly, How to cure that *evil* in *Pepin cider*.

Fifthly, A probable conjecture, how in some degree by the same *Method* to amend the *Hard-apple-cider*, and *French-Wine*.

Sixthly, That what is here propounded cannot chuse but be *wholsome*, and may be done to what degree every mans *Palate* shall wish.

Having now told your *Lordship*, what I will endeavour to do before I enter upon it, I must declare what I will not in the least pretend to do.

1. I do not pretend to any thing concerning the *planting* and *grafting* of *Trees*, &c.

Nor what *Trees* will soonest bear or last longest.

Nor what *sorts* of *Trees* are the best bearers, and may with least danger grow in *Common fields*.

Nor what *sort* of *fruit* will yield the greatest store of *Cider*.

Nor what *Cider* will keep the longest, and be the strongest, and wholesomest to *drink* constantly with *meat*.

The

Concerning Cider.

The only thing I shall endeavour, being to prescribe a way to make a sort of *Cider* pleasant and quick of taste, and yet wholesome to *drink*, sometimes, and in a moderate proportion: For, if this be an *Heresse*, I must confess my self guilty; that I prefer *Canary wine*, *Verdea*, the pleasantest *Wines* of *Greece*, and the *High-country-wines* before the *harsh Sherries*, *Vin de Hermitage*, and the *Italian* and *Portugal rough Wines*, or the best *Graves-wines*; not at all regarding that I am told, and do believe, that these *harsh wines* are more comfortable to the *stomack*, and a *Surfeit* of them less *noxious*, when taken; nor to be taken but with drinking greater quantities than can with safety be taken of those other pleasant *Wines*: I satisfy myself with this, that I like the *pleasant Wines* best; which yet are so wholesome, that a man may drink a moderate quantity of them without prejudice.

Nor shall I at all concern my self, whether this sort of *Cider* I pretend to is so *winous* a liquor; and consequently will yield so much *spirit* upon *Distillation*, or so soon make the *Country-man* think himself a *Lord*, as the *Hard-apple-cider* will do: nor whether it will last so long; for it is no part of my design to persuade the *World* to lay by the making of *Hard-apple-cider*; but rather in a degree to shew how to improve that in point of pleasantness, and that by the making and rightly ordering of *Cider* of the best *Eating-Apples*; as *Golden-pepins*, *Kentish-pepins*, *Pear-mains*, &c. there may be made a more pleasant liquor for the time it will last, than can be produced from those *Apples* which I call *Hard-Apples*, that is to say, *Red-strakes*, *Gennet-moyles*, the *Bromsfury-Crab*, &c. which are so *harsh* that a *Hog* will hardly eat them.

Nor shall I at all meddle with the making of *Perry*, or of any mixed drink of the juyce of *Apples* and *Pears*; though possibly what I shall say for *Cider* may be aptly applied to *Perry* also.

For the first particular, I asserted that the best *Apples* would make the pleasantest, which in my sence is the best *Cider*; (and I account those the best *Apples*, whose juyce is the pleasantest at the time when first pressed, before fermentation) I shall need (besides the experience of the last ten years) only to say, that it is an undeniable thing in all *Wines*, that the pleasantest *Grapes* make the richest and pleasantest *Wines*; and that *Cider* is really but the *Wine* of *Apples*, and not only made by the same way of *Compressi-on*; but lett to it self hath the same way of *Fermentation*; and therefore must be liable to the same measures in the choice of the materials.

To my second *Affertion*, that this truth was not formerly owned, by reason that in *Herefordshire*, and those Countries where they abound both with *Pepins* and *hard-apples* of all sorts, they made *Cider* of both sorts, and used them alike; that is, that as soon as they ground and pressed the *Apples* and strained the *Liquor*, they put it into their *Vessels* and there let it lye till it had wrought, and afterwards was settled again and *fined*; as not thinking it wholesome to drink till it had thus (as they call it) *putg'd* it self, and

and this was the frequent use of most men in the more *Southern* and *Western* parts of *England* also. Now when *Cider* is thus used, it is no wonder that when they came to broach it, they for the most part found their *Pepin-cider* not so pleasant as their *Moyle* or *Red strake-cider*; but to them it seemed a wonder, because they did not know the *reason* of it (which shall be my next work to make out) for till they knew the *reason* of this *effect*, they had no cause but to think it was the nature of the several *Apples* that produced it; and consequently to prefer the *Hard-Apple-cider*, and to use the other *Apples* (which were good to eat *raw*) for the *Table*: which was an use not less necessary, and for which the *hard-apples* were totally improper.

To my *third Assertion*, which is, that in *Herefordshire* they knew not what was the true cause why their *Pepin-cider* (for by that name I shall generally call all sorts of *Cider* that is made of *Apples* good to eat *raw*) was not, as they used it, so good as the *Cider* made of *hard-apples* (for by that name, for brevities sake, I shall call the *Cider* of *Moyle*, *Red-strake*, and all other sorts of *harsh Apples*, not fit to eat *raw*.) *First*, I say, for all *liquors* that are *Vinous*, the cause that makes them sometimes harder or less pleasant to the taste, than they were at the first pressing, is the too much *fermenting*: If *Wine* or *Cider* by any *accidental* cause do *ferment* twice, it will be harder than if it had *fermented* but once; and if it *ferment* thrice, it is harder and worse than if it had *fermented* but twice: and so onward, the oftner it *ferments* and the longer it *ferments*, it still grows the harder. This being laid as a *foundation*, before we proceed further we must first consider what is the cause of *fermentation* in *Wine*, *Cider*, and all other *Vinous Liquors*. Which (in my poor opinion) is the gross part of the *Liquor*, which escapes in the straining of the *Cider* (for in making of *Wine*, I do not find that they use the curiosity of straining) and which is generally known by the name of the *Lee* of that (*Wine* or) *Cider*. And this *Lee* I shall, according to its thickness of parts, distinguish into the *gross Lee*; and the *fly-ing Lee*.

Now, according to the old method of making and putting up of *Cider*, they took little care of putting up *only* the clear part of the *Cider* into their Vessels or *Cask*; but put them up thick and thin together, not at all regarding this *separation*; for experimentally they found that how thick soever they put it up, yet after it had thoroughly wrought or *fermented* and was settled again, it would still be clear; and perchance that which was put up the soonest after it was pressed and the thickest, would, when the *fermentation* was over, be the clearest, the briskest, and keep the longest. This made them confidently believe that it was not only not inconvenient to put it up quickly after the *pressing*, but in some degree necessary also to put it up soon after the *pressing*, so that it might have so much of the *Lee* mixed with it, that it might certainly, soon, and strongly put it into a *fermentation*, as the only means to make it *wholsom*, *clean* and *brisk*; and when it ei-

ther

ther did not (or that they had reason to doubt) that it would not work or ferment strongly enough, they have used to put in *Muflard* or some other thing of like nature to increase the fermentation.

Now that which in *Cider* of *Pepins* hath been a cause of greater fermentation than in *Cider* of *Hard-Apples*, being both used after the former method, is this, that the *Pepins* being a softer fruit are in the *Mill* bruised into smaller particles than the harder sorts of *Apples*; and consequently more of those small parts pass the strainer in the *Pepin-Cider* than in the *Cider* of *Hard-apples*, which causeth a stronger fermentation, and (according to my former principle) a greater loss of the native sweetness than in that of *Hard-apple-cider*; and not only so, but the *Lee* of the *Hard-apple-cider* being compounded of greater particles than the *Lee* of the *Pepin-cider*, every individual particle is in it self of a greater weight than the particles of the *Lee* of the *Pepin-cider*; and consequently less apt to rise upon small motions, which produceth this effect; that when the fermentation of the *Hard-apple-cider* is once over, unless the Vessel be stirred, it seldom falls to a second fermentation; but in *Pepin-cider* it is otherwise: For if the gross *Lee* be still remaining with the *Cider*, it needs not the motion of the Vessel to cause a new fermentation, but every motion of the *Air* by a change of weather from dry to moist will cause a new fermentation, and consequently make it work till it hath destroyed it self by losing its native sweetness. And this alone hath been the cause, why commonly when they broach their *Pepin-cider* they find it so unpleasant, that generally the *Hard-apple-cider* is preferred before it, although at first it was not so pleasant as the *Pepin-cider*. Yet after this mischief hath prevailed over the *Pepin-cider*, it is no wonder to find the *Hard-apple-cider* remaining not only the stronger, but even the more pleasant tasted. This to me seems satisfactory for the discovery of the cause, why in *Heresfordshire* the *Hard-apple-cider* is preferred before the *Pepin-cider*. But perhaps it may by some be objected, that they have before the ten years, in which you pretend you found this to be the cause of spoiling the *Pepin-cider*, been in *Heresfordshire*, and tasted the best *Cider* that *Country* did afford; and yet it was not like the *Pepin-cider* they had before then tasted in other parts. To this I do answer, at present, briefly, that by some mistake, or chance, the maker of this *Pepin-cider*, which proved good, had done that, or somewhat like that, which under the next Assertion I shall set down, as a Method to cure the inconveniences which happen to *Pepin-cider*, by the suffering it to ferment too often, or too strongly; but till that be explained it would be improper to shew more fully what these particular accidents might possibly be, which (without the intention of those persons which made the *Cider*) caused it to prove much better than their expectation, or indeed better than any could afterwards make: they possibly assigning the goodness of that *Cider* to somewhat that was not really the cause of that effect.

To

To justify my fourth *Affertion*, and shew a *Method* how to cure the inconveniency which happens to *Pepin-cider* by the over-working, I must first take notice of some things which I have been often told concerning *Wine*, and which indeed gave me the light to know what was the *cause* which had made *Pepin-cider* that had wrought long, *hard* when it came to be *clear* again. The thing I mean, is, that in divers parts, and even in *France* they make three sorts of *Wine* out of one and the same *Grapes*; that is, they first take the juice of the *Grapes* without any more pressing than what comes from their own weight in the *Vat*, and the bruising they have in putting into Vessel, which causeth the ripest of those *Grapes* to break, and the juice without any pressing at all makes the pleasantest and most delicate *Wine*: And if the *Grapes* were red, then is this first *Wine* very pale. The second sort they press a little, which makes a redder *Wine*, but neither so pleasant as the first, nor so harsh as the last, which is made by the utmost pressing of the very skins of the *Grapes*, and is by much more harsh, and of deeper colour than either of the other two. Now I presume the *cause* of this (at least in part) to be, that in the first sort of *Wine*, which hath little of the substance, beside the very juice of the *Grape*, there is little *Lee*, and consequently little fermentation; and because it doth not work long, it loseth but little of the original sweetness it had: The second sort being a little more pressed hath somewhat more of the substance of the *Grape* added to the juice; and therefore having more of that part which causeth fermentation put with it, ferments more strongly, and is therefore, when it hath done working, less pleasant than the first sort, which wrought less. And for the same reason the third sort being most of all pressed, hath most of the substance of the *Grape* mingled with the *Liquor*, and worketh the longest: but at the end of the working when it settles and is *clear*, it is much more harsh than either of the two first sorts. The thought of this made me first apprehend that the substance of the *Apple* mingled with the juice, was the cause of fermentation, which is really nothing else but an endeavour of the *Liquor* to free it self from those *Heterogeneous* parts which are mingled with it: And where there is the greatest proportion of those dissimilar parts mingled with the *Liquor*, the endeavour of *Nature* must be the stronger, and take up more time to perfect the separation: which when finished leaves all the *Liquor* clear, and the gross parts settled to the bottom of the *Vessel*, which we call the *Lee*. Nor did this apprehension deceive me; for when I began (according to the *Method* which I shall hereafter set down) to separate a considerable part of the *Lee* from the *Cider* before it had fermented, I found it to retain a very great part of its original sweetness, more than it would have done if the *Lee* had not been taken away before the fermentation; and this not once, but constantly for seven years.

Now the *Method* which I used, was this: When the *Cider* was first strained, I put it into a great *Vat*, and there let it stand twenty four hours at least (sometimes more, if the *Apples* were more ripe

than ordinary) and then at a *tap* before prepared in the *Vessel* three or four *inches* from the bottom I drew it into *pails*, and from thence filled the *Hogshead* (or lesser *Vessel*) and left the greatest part of the *Lee* behind; and during this time that the *Cider* stood in the *Vat*, I kept it as close covered with *hair-clothes* or *sacks* as I could; that so too much of the *spirits* might not evaporate.

Now possibly I might be asked why I did not, since I kept it so close in the *Vat*, put it at first into the *Vessel*? To which I answer, that had I put it at first into the *Vessel*, it would possibly (especially if the *weather* had chanced to prove wet and warm) have begun to *ferment* before that time had been expired; and then there would have been no possibility to have separated any part of the *gross Lee*, before the *fermentation* had been wholly finished; which keeping it only covered with these clothes was not in danger: For, though I kept it warm in some degree, yet some of the *spirits* had still liberty to *evaporate*; which had it been in the *Hogshead* with the *Bung* only open, they would not so freely have done; but in the first 24 *hours* it would have begun to *ferment*, and so my design had been fully lost: For those *spirits* if they had been too strongly *reverberated* into the *Liquor*, would have caused a *fermentation* before I could have taken away any part of the *gross Lee*. For the great *mystery* of the whole thing lies in this, to let so many of the *spirits* evaporate, that the *liquor* shall not *ferment* before the *gross Lee* be taken away; and yet to keep *spirits* enough to cause a *fermentation* when you would have it. For if you put it up as soon as it is *strained*, and do not let some of the *spirits* evaporate, and the *gross Lee* by its weight only to be separated without *fermentation*, it will *ferment* too much and lose its sweetness; and if none be left, it will not *ferment* at all; and then the *Cider* will be dead, flat and soure.

Then after it is put into the *Vessel*, and the *Vessel* fill'd all but a little (that is, about a *Gallon* or thereabout) I let it stand (the *Bung-hole* being left only covered with a *paper*, to keep out any dust or filth that might fall in) for 24 *hours* more; in which time the *grossest* part of the *Lee* being formerly left in the *Vat*, it will not *ferment*, but you may draw it off by a *Tap* some two or three inches from the bottom of the *Vessel*, and in that second *Vessel* you may stop it up, and let it stand safely till it be fit to *Bottle*; and possibly that will be within a day or more: but of this time there is no certain measure to be given; there being so many things that will make it longer, or less while before it be fit to *bottle*. As for *Example*, If the *Apples* were *over-ripe* when you stamped them, or ground them in the *Mill*, it will be the longer before it will be clear enough to *Bottle*; or if the *weather* prove to be warmer or moister than ordinary: or that your *Apples* were of such kinds, as with the same force in the stamping or grinding they are broken into smaller *particles* than other *Apples* that were of harder kinds.

Now, for knowing when it is fit to *Bottle*, I know no certain *Rule* that can be given, but to *broach* the *Vessel* with a small *Piercer*, and in that *hole* fit a *peg*, and now and then (two or three times in a day)

day) draw a little, and see what fineness it is of; for when it is *bottled* it must not be perfectly *fine*; for if it be so; it will not *fret* in the *bottle*, which gives it a fine quickness, and will make it *mantle* and sparkle in the *glass*, when you pour it out: And if it be too thick when it is *bottled*, then, when it hath stood some time in the *bottles* it will *ferment* so much that it may possibly either drive out the *Corks*, or break the *bottles*, or at least be of that sort (which some call *Potgun-drink*) that when you open the *bottles* it will fly about the house, and be so *windy* and *cutting* that it will be inconvenient to drink: For the right *temper* of *Bottle-Cider* is, that it *mantle* a little and *sparkle* when it is put out into the *glass*; but if it *froth* and *fly*, it was *bottled* too soon: Now the *temper* of the *Cider* is so nice, that it is very hard when you *bottle* it to foretell which of these two conditions it will have: but it is very easie within a few days after (that is to say, about a *week*, or so) to find its *temper* as to this point. For first, if it be *bottled* too soon; by this time it will begin to *ferment* in the *Bottles*, and in that case you must open the *Bottles*, and let them stand open two or three *minutes*, that that abundance of *spirits* may have *Vent*, which otherwise kept in would in a short time make it of that sort I called before *Potgun-drink*; but being let out, that danger will be avoided, and the *Cider* (without danger of breaking the *bottles*) will *keep* and *ferment*, but not too much. Now this is so easie a *remedy*, that I would advise all men rather to erre on the hand of *bottling* it too soon, than let it be too *fine* when they *bottle* it; for if so, it will not *fret* in the *bottle* at all; and consequently, want that *briskness* which is desirable.

Yet even in this case there is a *Remedy*, but such a one as I am always very careful to avoid, that so I may have nothing (how little soever) in the *Cider* but the *juice* of the *Apple*: But the *remedy* is, in case you be put to a necessity to use it, that you open every *bottle* after it hath been *bottled* about a week or so, and put into each *bottle* a little piece of *white Sugar*, about the bigness of a *Nutmeg*, and this will set it into a little *fermentation*, and give it that *briskness* which otherwise it would have wanted. But the other way being full as easie, and then nothing to be added but the *juice* of the *Apple* to be simply the substance of your *Cider*, I chuse to prefer the error of being in danger to *bottle* the *Cider* too soon, rather than too late: Nay sometimes in the *bottling* of one and the same *Hogshead* (or other *Vessel*) of *Cider*, there may the first part of it be too *fine*; the second part *well*; and the last not *fine* enough: and this happens when it is *broached* first *above* the *middle*, and then *below*; and then when it begins to run low, *tilted* or raised at the further end, and so all drawn out. But to avoid this inconvenience, I commonly set the *bottles* in the order they were filled, and so we need not open all to see the condition of the *Cider*; but trying one at each end, and one in the middle, will serve the turn: And to prevent the inconveniency, *broach* not at all above the *middle*, nor too *low*; and when you have drawn all that will run at the *Tap*, you may be
secure

secure it is so far of the same *temper* with the first *bottle*. And then *tilt* the *Vessel*; but draw no more in three or four hours at the least after, and set them by themselves, that so, if you please, you may three or four days after pour them off into other *bottles*; and leave the *gross* behind: And by this means though you have a less number of *bottles* of *Cider* than you had, yet this will continue good, and neither be apt to *fly*, nor have a *sediment* in the *bottle*, which after the first *glass* is filled will render all the rest of the *bottle* thick and muddy.

By all this which I have said, I think it may be made out that those persons which I mentioned in the end of the last *Paragraph*, that sometimes had *Pepin-cider* better than ordinary, and indeed then they could make again, were beholding to *chance* for it; either that their *Apples* were not so full ripe at that as at other times, and so not bruised into so small parts; but the *fermentation* was ended in the *Vessel*, and the *Lee* being then *gross* settled before the *Cider* had *fermented* so long as to be hard.

Or else, by some *Accident* they had not put it so soon into the *Vessel*, but that in part it was settled before they put it up, and the grossest part of the *Lee* left out of the *Vessel*.

Or else, the *Bung* being left open some part of the *spirits* evaporated; and that made the *fermentation* the weaker, and to last the less time.

Or else, they put it up in such a *season* that the *weather* continued cold and frosty till the *fermentation* was quite over; and then it having wrought the less time, and with the less violence, it remained more pleasant and rich than otherwise it would have done.

Now for the *time* of making *Pepin-cider*, I chuse to do it in the beginning of *November*, after the *Apples* had been gathered and laid about three weeks or more in the *loft*, that so the *Apples* might have had a little time to *sweat* in the house before the *Cider* was made, but not too much; for if they be not full ripe before they be gathered, and not suffered to lye a while in the *heap*, the *Cider* will not be so pleasant; and if they be too ripe when they are gathered, or lye too long in the *heap*, it will be very difficult to separate the *Cider* from the *gross Lee* before the *fermentation* begins: and in that case it will work so long, that when it *finishes* the *Cider* will be hard; for when the *Apples* are too mellow, they break into so small particles, that it will be long before the *Lee* settles by its weight only: and then the *fermentation* may begin before it be separated, and so destroy your intention of taking away the *gross Lee*. And if the *Apples* be not mellow enough, the *Cider* will not be so pleasant as it ought to be.

This being said for the *time* of making the *Pepin-Cider*, may (*mutatis mutandis*) serve for all other sorts of *Summer-fruit*; as the *Kentish codling*, *Marigolds*, *Gilly-flowers*, *Summer-pear-mains*, *Summer-pepins*, *Holland-pepins*, *Golden-pepins*, and even *Winter-pear-mains*. For though they must not be made at the same *time* of the year, yet they must be made at the *time* when each respective

spective fruit is in the same condition that I before directed that the *Winter-pepin* should be. Nay, even in the making of that *Cider*, you are not tied to that time of the year to make your *Cider*; but as the condition of that particular year hath been, you may make your *Cider* one, two, three or four weeks later; but it will be very seldom that you shall need to begin to make *Kentish-pepin-Cider* before the beginning of *November*, even in the most *Southern* parts of *England*.

The next thing I shall mention, is, the ordering of your bottles after they are filled; for in that consists no small part of causing your *Cider* to be in a just condition to drink: For, if it does ferment too much in the bottle, it will not be so convenient to drink, neither for the taste, nor wholsomeness; and if it ferment not at all, it will want that little *fret* which makes it grateful to most Palates. In order to this, you must observe, first, whether the *Cider* were bottled too early, or too late, or in the just time: If too early, and that it hath too much of the flying Lee in it, then you must keep it as cool as you can, that it may not work too much, and if so little that you doubt it will not work at all, or too little; you must by keeping it from the inconvenience of the external air, endeavour to hasten and increase the fermentation. And this I do, by setting it in sand to cool, and by covering the bottles very well with straw, when I would hasten or increase the fermentation.

And if I find the *Cider* to have been bottled in its just time, then I use neither, in ordinary weather; but content my self that it stands in a close and cool Cellar, either upon the ground, or upon shelves; saving in the time that I apprehend frost, I cover it with straw, which I take off as soon as the weather changeth; and consequently about the time that the cold East winds cease; which usually with us, is in the beginning of April; I set my bottles into sand up to the necks. And by this means I have kept *Pepin-cider* without change till September, and might have kept it longer, if my store had been greater: For by that time the heats were totally over, and consequently, the cause of the turn of *Cider*.

Having now declared what is (according to my opinion) to be done to preserve *Cider*, if not in it's original sweetness, yet to let it lose as little as is possible; I shall now fall upon my fifth Assertion, which is, that it is probable that somewhat like the former Method may in some degree mend *Hard-Apple-cider*, *Perry*, or a drink made of the mixtures of Apples and Pears; and not impossible that somewhat of the same nature may do good to *French-wines* also.

First, for *French-wines*, I think what I have in the beginning of this discourse declared, as the hint which first put me upon the conceit, that the over-fermenting of *Cider* was the cause that it lost of its original sweetness (*viz.* the making of three sorts of Wine, of one sort of Grapes) is a testimony that the first sort of Wine hath but little of the gross Lee, and consequently, ferments but little; nor loseth but little of the original sweetness; which makes

makes it evident that the same thing will hold in *Wine*, which doth in *Cider*; but the great difficulty is (if I be rightly informed) that they use to let the *Wine* begin to ferment in the *Vat* before they put it into the *Hogheads* or other *Vessels*; and thus they do, that the *Husks* and other *Filth* (which in the way they use, must necessarily be mingled with the *Wine*) may rise in a *skum* at the top, and so be taken off: Now if they please, as soon as it is pressed, to pass the *Wine* through a *strainer*, without expecting any such *purgation*, and then use the same *Method* formerly prescribed for *Cider*, I do not doubt but the gross part of the *Lee* of *Wines*, being thus taken away, there will yet be enough left to give it a *fermentation* in the *bottles*, or second *vessel*, where it shall be left to stand, in case you have not *bottles* enough to put up all the *Wine* from which you have thus taken away the gross *Lee*. |

This *Wine* I know not whether it will last so long as the other used in the ordinary way, or not; but this I confidently believe, it will not be so harsh as the same would have been if it had been used in the ordinary way; and the pleasantness of *Taste*, which is not unwholesome, is the chief thing which I prefer both in *Wine* and *Cider*.

Now for the *Hard-apple-Cider*, that it will receive an improvement by this way of ordering, hath been long my opinion; but this year an accident happened, which made it evident that I was not mistaken in this conjecture. For there was a *Gentleman* of *Herefordshire*, this last *Autumn*, that by accident had not provided *Cask* enough for the *Cider* he had made; and having six or seven *Hogheads* of *Cider* for which he had no *Cask*, he sent to *Worcester*, *Glocester*, and even to *Bristol*, to buy some, but all in vain; and when his *servants* returned, the *Cider* that wanted *Cask* had been some five days in the *Vat* uncovered; and the *Gentleman* being then dispatching a *Barque* for *London* with *Cider*, and having near hand a conveniency of getting *Glass-bottles*, resolved to put some of it into *bottles*; did so, and filled seven or eight *Hampers* with the clearest of this *Cider* in the *Vat*, which had then never wrought, nor been put into any other *Vessel* but the *Vat*; the *Barque* in which his *Cider* came had a tedious passage; that is, it was at least seven weeks before it came to *London*, and in that time most of his *Cider* in *Cask* had wrought so much that it was much harder than it would have been if it had according to the ordinary way lain still in the *Country*, in the place where it was first made and put up, and consequently, wrought but once.

But the other, which was in *Bottles*, and escaped the breaking, that is, by accident, had less of the *Lee* in it than other *bottles* had, or was not so hard stopped, but either before there was force enough from the *fermentation* to break the *bottle*, or that the *Cork* gave way a little, and so the *air* got out; or that the *Bottles* were not originally well corked, was excellent good, beyond any *Cider* that I had tasted out of *Herefordshire*; so that from this *Experience* I dare confidently say, that the using *Hard-apple-cider* after the former *Method*, prescribed for *Pepin-cider*, will make it retain

tain a considerable part of sweetness more than it can do after the *Method* used hitherto in *Herefordshire*. Nor do I doubt but my *Method* will in a degree have the same effect in *Perry*, and the drink (as yet without a name that I do know of) which is made of the *Juice* of *Wardens*, *Pears*, and *Apples*, by several persons, in several proportions; for the *Reason* being the same, I have no cause to doubt, but the effect will follow, as well in those *Drinks*, as in *Cider* and *Wines*.

I am now come to my last *Affertion*; that *Cider* thus used cannot be *unwholesom*, but may be done to what degree any mans *Palate* desires.

First, It cannot be *unwholesome*, upon the same measure that *stummed Wine* is so; for that unwholesomeness is by leaving the cause of *fermentation* in the *Wine*, and not suffering it to produce its effect before the *Wine* be drank, and it *ferments* in mans body: and not only so, but sets other *humours* in the body into *fermentation*; and this prejudiceth their *health* that drink such *Wines*.

Now though *Cider* used in my *method* should not *ferment* at all, till it come into the *bottle*, and then but a little; yet the cause of *fermentation* being in a great degree taken away, the rest can do no considerable harm to those which drink it, being in it self but little, and having wrought in the *bottle* before men drink it; nor indeed do I think, nor ever find, that it did any inconvenience to my self, or any person that drank it when it was thus used.

Secondly, because the difference of mens *palates* and *constitutions* is very great; and that accordingly men like or dislike drink that hath more or less of the *fret* in it; and that the consequences in point of health are very different, in the *method* by me formerly prescribed: it is in your *power* to give the *Cider* just as much *fret* as you please, and no more; and that by several ways: for either you may *bottle* it sooner or later, as you please: or you may *bottle* it from two *Taps* in your *Vessel*, and that from the *higher* *Tap* will have less *fret*, and the *lower* more: or you may *bottle* your *Cider* all from one *Tap*, and open some of the *bottles* about a week after for a few *minutes*, and then stop them up again; and that which was thus stop'd will have the less *fret*: or, if your *Cider* be *bottled* all from one *Tap*, if you will (even without opening the *bottles*) you may make some difference, though not so considerable as either of the former ways, by keeping part of the *bottles* warmer, for the first two *Months*, than the rest; for that which is kept warmest will have the most *fret*.

Sir PAUL NEILE'S second Paper.

My Lord,

THe Paper which by the Command of the *Royal Society* I delivered in the last year, concerning the ordering of *Cider*, I have by this years experience found defective in one particular, of which I think fit by this to give you notice, which is thus: Where-as in the former Paper I mention, that after the *Pepin-Cider* hath stood 24 hours in the *Vat*, it might be drawn off into Pails, and so put into the Vessel; and that having stood a second 24 hours in that Vessel, it might be drawn into another Vessel, in which it might stand till it were fit to *Bottle*; for the particulars of all which proceeding I refer to the former Paper; and shall now only mention, That this last year we were fain to draw it off into several Vessels, not only as is there directed, *twice*, but most of our *Cider* five, and some *six* times; and not only so, but we were after all this fain to *precipitate* the *Lee* by some of those ways mention'd by Dr. *Willis* in the 7th Chap. of his Treatise *De fermentatione*. Now though this be more of trouble than the Method by me formerly mention'd; yet it doth not in the least destroy that *Hypothesis* which in the former Discourse I laid down, (*viz.*) That it was the leaving too much of the *Lee* with the *Cider*, which upon the change of air, set it into a new *fermentation*, and consequently made it lose the sweetness; for this change by the indisposition of the *Lee* to settle this year more than others, hath not hindred the goodness of the *Cider*; but that when it was at last mastered, and the *Cider* bottled in a fit temper, it was never more pleasant and quick than this year: but I find that this year our *Cider* of Summer-Apples is already turned sowre, although it be now but the first of *January*; and the last year it kept very well till the beginning of *March*; which makes me fear that our *Pepin-Cider* will not keep till this time twelve-moneth, as our *Pepin-Cider* of the last year doth till this day, and still retains its original pleasantness without the least turn towards sowreness.

And I am very confident, the difference of time and trouble, which this year we found in getting the *Cider* to *fine* and be in a condition to *Bottle*, was only the effect of a very bad and wet Summer, which made the Fruit not ripen kindly; and to make it yet worse, we had just at the time when we made our *Cider*, this year, extream wet and windy weather, which (added to the unkindliness of the Fruit) was the whole cause of this alteration: And however my *Hypothesis* as yet remains firm, for if by taking any part of the *Lee* from the *Cider* you can preserve it in its original sweetness, it is not at all material whether it be always to be done by twice drawing off from the *Lee*, or that it must sometimes

times be done with more trouble, and by oftner repeating the same Work, so that finally it be done, and by the same means, that is, by taking away part of the *Lee*, which otherwise would have caused too much *fermentation*; and consequently have made the *Cider* lose part of its original sweetness.

My Lord, I should not have presumed to have given you and the *Society* the trouble of perusing this Paper, but that, if possible, I would have you see, that what I think an errour in any opinion that I have held, I am willing to own; and yet I desire not that you should think my mistake greater than in Reality it is.

H 2

OBSER-

OBSERVATIONS
Concerning the
Making, and Preserving
OF
CIDER:
BY
JOHN NEWBURGH Esq;

I.

IF the *Apples* are made up immediately from the *Tree*, they are observ'd to yield *more*, but not so *good* Cider, as when *boarded* the space of a Moneth or six weeks; and if they contract any unpleasing taste (as sometimes 'tis confess'd they do) it may be imputed to the Room they lie in, which if it hath any thing in it, of either too sweet or unfavoury smell, the *Apples* (as things most susceptible of impressiion) will be easily tainted thereby.

One of my acquaintance, when a child, hoarding *Apples* in a Box where *Rose-Cakes* and other sweets were their companions, found them of so unfavoury taste, and of so rank a relish deriv'd from the too near neighbour-hood of the Perfumes, that even a childish palate (which seldom mislikes any thing that looks like an *Appte*) could not dispense with it.

2.

It is therefore observ'd by prudent *Fruiterers*, to lay their *Apples* upon clean new made *Reed*, till they grind them for *Cider*, or otherwise make use of them. And if, notwithstanding this caution, they contract any rottenness before they come to the *Cider-press*, the damage will not be great, if care be had before the *Apples* be ground, to pick out the sinnewed and the black-rotten; the rest, though somewhat of putrefaction hath pass'd upon them, will not render the *Cider* ill condition'd, either in respect of taste, or duration.

A

A Friend of mine having made provision of *Apples* for *Cider*, whereof so great a part were found rotten when the time of grinding them came, that they did, as 'twere wash the Room with their Juice, through which they were carried to the *Wring*, had *Cider* from them not only passable, but exceeding good; though not without previous use of the pre-mention'd Caution. I am also assured by a Neighbour of mine, That a Brother of his who is a great *Cider-Merchant* in *Devonshire*, is by frequent experience so well satisfied of the harmlessness of *Rotten-Apples*, that he makes no scruple of exchanging with any one that comes to his *Cider-press*, a Bushel of *sound-Apples* for the same measure of the other. Herein, I suppose, (if in other respects they be not prejudicial) he may be a gainer by the near compression of the tainted Fruit, which, as we speak in our Country Phrase, will go nearer together than the other. His advantage may be the greater, if the conceit which goes current with them be not a bottomless fancy, That a convenient quantity of *rotten-Apples* mixt with the sound, is greatly assistant to the work of *fermentation*, and notably helps to clarify the *Cider*.

3.

It matters not much whether the *Cider* be forced to purge it self by working downwards in the Barrel, or upwards at the usual Vent, so there be matter sufficient left on the top for a thick skin or film, which will sometimes be drawn over it when it works, after the usual manner, as when 'tis presently stopt up with space left for *fermentation*, to be perform'd altogether within the Vessel.

The thick skin, or *Leathern-coat*, the *Cider* oftentimes contracts, as well after it hath purged it self after the usual manner, as otherwise, is held the surest preservation of its *spirits*, and the best security against other inconveniences incident to *this*, and other like *vinous* Liquors, of which the *Devonshire Cider-Merchants* are so sensible, that, beside the particular care they take, that matter be not wanting for the Contexture of this upper garment by stopping up the Vessel as soon as they have fill'd it; (with the allowance of a Gallon or two upon the score of *Fermentation*) they cast in Wheaten Bran, or Dust, to thicken the Coat, and render it more certainly Air-proof. And I think you will believe their care in this kind not impertinent, if you can believe a story which I have to tell of its marvellous efficacy: A near neighbour of mine assures me, that his Wife having this year filled a Barrel with *Mead*, being strong, it wrought so boisterously in the Vessel, that the good Woman casting her eye that way, accidentally, found it leaking at every chink, which ascribing to the strength of the Liquor, she thought immediately by giving it vent, to save both the Liquor and the Vessel, but in vain; both the Stopples being pulled out, the leakage still continued, and the Vessel not at all reliev'd, till casually at length putting

putting in her finger at the top, she brake the premention'd film; which done, a good part of the *Mead* immediately flying out, left the residue in peace, and the leakage ceased. It may seem incredible that so thin a skin should be more coercive to a mutinous Liquor, than a Barrel with Oaken-Ribs, and stubborn Hoops: But I am so well assur'd of the veritableness of my Neighbours Relation, that I dare not question it: The reason of it let wiser men determine.

4.

If the *Apples* be abortive, having been (as it usually happens) shaken down before the time by a violent Wind, it is observ'd to be so indispensably necessary that they lie together in hoard, at least till the usual time of their maturity, that the *Cider* otherwise is seldom, or never found worth the drinking.

A Neighbour told me, That making a quantity of *Cider* with *Wind-falls* which he let ripen in the Hoard, near a month interceding between the time of their decussion, and that which Nature intended for their maturity; his *Cider* prov'd very good, when all his Neighbours who made up their untimely fruit as soon as it fell, had a crude, austere, indigested Liquor, not worth the name of *Cider*.

5.

No Liquor is observ'd to be more easily affected with the savour of the *Vessel* it is put into, than *Cider*; therefore singular care is taken by discreet *Cider-Masters*, That the *Vessel* be not only *tasteless*, but also well prepar'd for the *Liquor* they intend to fill it with. If it be a new *Cask*, they prepare it by scalding it with Water, wherein a good quantity of *Apple-pomice* hath been boil'd: if a tainted *Cask*, they have divers ways of cleansing it. Some boil an *Ounce* of *Pepper* in so much Water as will fill an *Hogshead*, which they let stand in a *Vessel* of that capacity two or three days, and then wash it with a convenient quantity of fresh Water scalding hot, which they say is an undoubted cure for the most dangerously infected *Vessel*. A Friend and Neighbour of mine herewith cured a *Vessel* of so extream ill savour, as it was thought it would little less than poyson any Liquor that was put into it. Others have a more easie, and perhaps no less effectual Remedy. They take two or three stones of quick-Lime, which in six or seven Gallons of Water they set on work in the *Hogshead* being close stoppt, and tumbling it up and down till the commotion cease, it doth the feat. Of *Vessels* that have been formerly used, next to that which hath been already acquainted with *Cider*, a *White-Wine*, or *Vinegar Cask* is esteem'd the best; *Claret* or *Sack* not so good. A Barrel newly tenanted by small *Beer* suits better with *Cider* than a strong-*Beer* *Vessel*.

6. Half

6.

Half a peck of unground Wheat put to Cider that is harsh and eager, will renew its *fermentation*, and render it more mild and gentle. Sometimes it happens without the use of any such means to change with the season, and becomes of sharp and sour unexpectedly *benigne* and *pleasant*. Two or three Eggs whole put into an Hogshead of Cider that is become sharp and near of kin to *Vinegar*, sometimes rarely lenifies and gentlizes it. One pound of broad-figs slit, is said to dulcifie an Hogshead of such Cider.

A Neighbour *Divine*, of my acquaintance, assured me, That coming into a *Parsonage-house* in *Devonshire*, where he found eleven Hogsheads of Cider; being unwilling to sell what he never bought, he was three years in spending that store which the former *Incumbent* had left him; and it greatly amus'd him (as well it might, if he remember'd the old Proverb, *He mends as sour Ale in Summer*) to find the same Cider, which in *Winter* was almost as sharp as *Vinegar*, in the *Summer* become a potable and good-natur'd Liquor.

7.

A little quantity of *Mustard* will clear an Hogshead of muddy Cider. The same Virtue is ascribed to two or three rotten Apples put into it. *Mustard* made with *Sack* preserves boild Cider, and spirits it egregiously.

8.

Cider is found to ferment much better in mild and moist, than in cold and dry weather. Every ones Experience hath taught him so much in the late frosty season. If it had not wrought before, it was in vain to expect its working or clearing then, unless by some of the artificial means premention'd, which also could not be made use of in a more inconvenient time.

9.

The latter running of the Cider bottled immediately from the *Wring*, is by some esteem'd a pure, clear, small, well relisht Liquor; but so much undervalued by them who desire strong drinks more than *wholesome*, that they will not suffer it to incorporate with the first running.

In *Devonshire* where their *Wrings* are so hugely great, that an Hogshead or two runs out commonly before the Apples suffer any considerable pressure, they value this before the other, much
after

after the rate which we set upon *life-honey* (that which in like sort drops freely out of the *Combs*) above that which renders not it self without *compression*. In *Jersey* they value it a *Crown* upon an *Hogshead* dearer than the other: (This I take from the Relation of one of my Neighbours, who sometimes lived in that *Island*, which for *Apples* and *Cider* is one of the most famous of all belonging to his *Majesties* Dominions) Yet even upon *this*, and their choicest *Ciders*, they commonly bestow a pail of *water* to every *Hogshead*, being so far (it seems) of *Pindar's* mind, that they fear not any prejudice to their most excellent *Liquors* by a dash of that most excellent *Element*: Inasmuch that it goes for a common saying amongst them, That if any *Cider* can be found in their *Island*, which can be prov'd to have no mixture of *Water*, 'tis clearly forfeited. It seems they are strongly conceited, that this addition of the most useful *Element*, doth greatly meliorate their *Cider*, both in respect of *Colour*, *Taste*, and *Clarity*.

10.

The best *Cider-fruit* with us in this part of *Dorsetshire* (lying near *Bred-port*) next to *Pepin* and *Pearmain*, is a *Bitter-sweet*, or (as we vulgarly call them) *Bitter-scale*, of which for the first, the *Cider* unboil'd keeps well for one year; boiling it you may keep it two years or longer.

About seven years since I gave my self the Experience of *Bitter-scale Cider* both crude and boil'd. I call'd them both to account at twelve Months end. I then found the *crude Cider* seemingly as good, if not better, than the *boiled*. But, having stopt up the *boil'd*, I took it to task again about ten Months after. At which time, I found it so excessively strong, that five persons would hardly venture upon an ordinary *Glass* full of it. My friends would hardly believe but I had heightned it with some of my *Chymical Spirits*. The truth is, I do not remember that I ever drunk any *Liquor*, on this side *Spirits*, so highly strong, and *spirituous*; but wanting pleasantness answerable to its strength, I was not very fond of my *Experiment*. In which I boil'd away, as I remember, more than half.

11.

A Neighbour having a good Provent of *pure-Lings* (an *Apple* of choice account with us) making up a good part of them to *Cider*, expected rare *Liquor*, but it prov'd very mean and pitiful *Cider*, as generally we find that to be, which is made without mixture. We have few *Apples* with us, beside the *Bitter-scale*, which yield good *Cider* alone; next to it

is a *Deans-Apple*, and the *Pelefantine* I think may be mention'd in the third place; neither of which need the Addition of other *Apples* to set off the Relish, as do the rest of our choicest Fruits. *Pepins*, *Pearmains*, and *Gilliflowrs* commixt, are said to make the best *Cider* in the world. In *Jersey* 'tis a general observation, as I hear, That the more of red any *Apple* hath in its rind, the more proper it is for this use. *Paleface's-Apples* they exclude as much as may be from their *Cider-Vat*. 'Tis with us an observation, That no *sweet-Apple* that hath a tough rind, is bad for *Cider*.

12.

If you *boil* your *Cider*, special care is to be had, That you put it into the *furnace* immediately from the *Wring*; otherwise, if it be let stand in *Vats* or *Vessels* two or three days after the pressure, the best, and most *spirituous* part will ascend, and vapour away when the fire is put under it; and the longer the *boiling* continues, the less of goodness, or virtue will be left remaining in the *Cider*.

My *Distillations* sufficiently instruct me, That the same *Liquor* which (after *fermentation* hath pass'd upon it) yields a plentiful quantity of *spirit*, drawn off unfermented, yields nothing at all of *spirit*. And upon the same account it is undoubtedly certain, That *Cider* boil'd immediately from the *Wring*, hath its *spirits* compressed, and drawn into a narrower compass, which are for the most part wash'd and evaporated by late unseasonable boiling.

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CONCERNING C I D E R,

By Doctor *S M I T H*.

THE best time to *grind* the *Apples* is immediately from the *Tree*, so soon as they are thoroughly ripe: for, so they will yield the greater quantity of *Liquor*, the *Cider* will drink the better, and last longer than if the *Apples* were hoarded: For *Cider* made of hoarded *Apples* will always retain an unpleasing taste of the *Apples*, especially if they contract any rottenness.

The *Cider* that is ground in a *Stone-case* is generally accused to taste unpleasantly of the *Rinds*, *Stems*, and *Kernels* of the *Apples*; which it will not if ground in a *Case* of *Wood*, which doth not bruise them so much.

So soon as the *Cider* is made, put it into the *Vessel* (leaving it about the space of one *Gallon* empty) and presently stop it up very close: This way is observed to keep it longer, and to preserve its *spirits* better than the usual way of filling the *Vessel* quite full, and keeping it open till it hath done *fermenting*.

Cider put into a new *Vessel* will often taste of the *Wood*, if it be pierced early; but the same stopped up again, and reserved till the latter end of the year, will free it self of that taste.

If the *Cider* be sharp and thick it will recover it self again: But if sharp and clear, it will not.

About *March* (or when the *Cider* begins to sparkle in the glass) before it be too fine, is the best time to bottle it.

Cider will be much longer in clearing in a mild and moist, then in a cold and dry *Winter*.

To every *Hogshead* of *Cider*, designed for two years keeping, it is requisite to add (about *March*, the first year) a quart of *Wheat* unground.

The best *Fruit* (with us in *Glocester-shire*) for the first years *Cider*, are the *Red-strake*; the *White* and *Red Must-apple*, the sweet and sour *Pepin*, and the *Harvey-apple*.

Pearmains alone make but a small liquor, and hardly clearing of it self; but, mixed either with sweet or sour *Pepins*, it becomes very brisk and clear.

Must-apple-cider (though the first made) is always the last ripe; by reason that most of the *pulp* of the *Apple* passeth the *strainer* in pressing, and makes it exceeding thick.

The *Cider* of the *Bromsbury-Crab*, and *Fox-whelp*, is not fit for drinking, till the *second year*, but then very good.

The *Cider* of the *Bromsbury-Crab* yields a far greater proportion of *spirits*, in the distillation, than any of the others.

Crabs and *Pears* mixed make a very pleasing *Liquor*, and much sooner ripe than *Pears* alone.

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OF CIDER.

By Capt. SYLAS TAYLOR.

Herefordshire affords several sorts of *Cider-apples*, as the two sorts of *Red-strakes*, the *Gennet-moyle*, the *Summer-violet*, or *Fillet*, and the *Winter-fillet*; with many other sorts which are used only to make *Cider*. Of which some use each sort *simply*; and others *mix* many sorts together. This *County* is very well stored with other sorts of *Apples*; as *Pepins*, *Pearmains*, &c. of which there is much *Cider* made, but not to be compared to the *Cider* drawn from the *Cider-apples*; among which the *Red-strakes* bear the Bell; a *Fruit* in it self scarce edible; yet the *juice* being pressed out is immediately pleasant in taste, without any thing of that *restringency* which it had when incorporated with the *meat*, or *flesh* of the *Apple*. It is many times *three Months* before it comes to its *clearness*, and *six Months* before it comes to a ripeness fit for *drinking*; yet I have tasted of it *three years old*, very pleasant, though dangerously strong. The colour of it, when *fine*, is of a sparkling *yellow*, like *Canary*, of a good full body, and *oily*: The *taste*, like the *Flavour* or *perfume* of excellent *Peaches*, very grateful to the *Palate* and *Stomach*.

Gennet-moyles make a *Cider* of a smaller body than the former, yet very pleasant, and will last a year. It is a good eating pleasant sharp fruit, when ripe, and the best *Tart-apple* (as the *Red-strake* also) before its ripeness. The *Tree* grows with certain knotty *extuberancies* upon the *branches* and *boughs*; below which *knot* we cut off boughs the thickness of a mans *wrist*, and place the knot in the ground, which makes the *root*; and this is done to raise this *fruit*; but very rarely by *grafting*.

Of *Fillet*s of both sorts (*viz.* *Summer* and *Winter*) I have made *Cider* of that proportionate taste and strength, that I have deceived several experienced *Palates*, with whom (simply) it hath passed for *White-Wine*; and *dashing* it with *Red-Wine*, it hath passed for *Claret*; and mingled with the *Syrup* of *Rasp'yes* it makes an excellent *womans wine*: The fruit is not so good as the *Gennet-moyle* to eat: The *Winter-fillet* makes a *lasting Cider*, and the

Summer-fillet an early Cider, but both very strong; and the *Apples* mixt together make a good Cider.

These *Apples* yield a liquor more grateful to my *Palate* (and so esteem'd of in *Herefordshire* by the greater *Ciderists*) than any made of *Pepins* and *Pearmains*, of which sorts we have very good in that *Country*; and those also both *Summer* and *Winter* of both sorts, and of which I have drank the Cider; but prefer the other.

Grounds separated only with a *Hedge* and *Ditch*, by reason of the difference of *Soils* have given a great alteration to the Cider, notwithstanding the *Trees* have been grafted with equal care, the same *Grass*s, and lastly, the same care taken in the making of the Cider. This as to the *Red-strake*; I have not observ'd the same niceness in any other fruit; for *Gennet-moyles*, and *Fillets* thrive very well over all *Herefordshire*. The *Red-strake* delights most in a fat soil: *Hamlacy* is a rich intermixt soil of *Red-fat-clay* and *Sand*; and *Kings-capel* a low hot sandy ground, both well defended from noxious *Winds*, and both very famous for the *Red-strake-cider*.

There is a *Pear* in *Hereford* and *Worcester-shires*, which is called *Bareland-pear*, which makes a very good Cider. I call it Cider (and not *Perry*) because it hath all the *properties* of Cider. I have drank of it from half a year old to two years old. It keeps it self without *Roping* (to which *Perry* is generally inclined) and from its taste: *Dr. Beal*, in his little *Treatise* called the *Herefordshire-Orchard*, calls it deservingly a *Masculine Drink*; because in taste not like the sweet *luscious feminine* juice of *Pears*. This *Tree* thrives very well in barren ground, and is a fruit (with the *Red-strake*) of which *Swine* will not eat; therefore fittest to be planted in *Hedge-rows*.

Red strakes and other *Cider-apples* when ripe (which you may know partly by the blackness of the *Kernels*, and partly by the colour and smell of the fruit) ought to be gathered in *Baskets* or *Bags*, preserved from bruising, and laid up in heaps in the *Orchard* to sweat; covered every night from the dew: Or else, in a *Barn-floor* (or the like) with some *Wheat* or *Rye-straw* under them, being kept so long till you find, by their *mellowing*, they are fit for the *Mill*.

They that grind, or bruise their *Apples* presently upon their gathering, receive so much liquor from them, that between twenty or twenty two *Bushels* will make a *Hogshead* of Cider: but this Cider will neither keep so well, nor drink with such a fragrance as is desired and endeavoured.

They that keep them a month or six weeks hoarded, allow about thirty *bushels* to the making of a *Hogshead*; but this hath also an inconvenience; in that the Cider becomes not fine, or fit for drinking, so conveniently as a mean betwixt these two will afford.

Keep them then about a *fort-night* in a board, and order them to be of such a cast by this *Mellowing*, that about twenty

ty five Bushels may make a Hogshead, after which mellowing proceed thus.

1. Pick and clear your Apples from their stalks, leaves, moaziness, or any thing that tends toward rottenness or decay.

2. Lay them before the stone in the Cider-Mill, or else beat them small with Beaters (such as Paviers use to fix their pitching) in deep troughs of Wood or Stone, till they are fit for the Press.

3. Having laid clean wheat straw in the bottom of your Press, lay a heap of bruised Apples upon it, and so with small handfuls or wisps of straw, which by twisting takes along with it the ends of the straw laid first in the bottom, proceed with the bruised Apples, and follow the heaps with your twisted straw, till it comes to the height of two foot, or two foot and a half; and so with some straw drawn in by twisting, and turned over the top of it (so that the bruised Apples are set as it were into a deep Cheese-vat of straw, from which the Country people call it their Cider-Cheese) let the board fall upon it even and flat, and so engage the force of your skrew or Press so long as any Liquor will run from it. Instead of this Cheese others use baggs of Hair-cloth.

4. Take this Liquor thus forced by the Press, and strain it thorough a strainer of hair into a Vat, from whence straight (or that day) in pails carry it to the Cellar, tuning it up presently in such Vessels as you intend to preserve it in; for I cannot approve of a long evaporation of spirits, and then a disturbance after it settles.

5. Let your Vessels be very tight and clean wherein you put your Cider to settle: The best form is the Stund or stand, which is set upon the lesser end, from the top tapering downwards; as suppose the head to be thirty inches diametre, let then the bottom be but eighteen or twenty inches in diametre; let the Tun-hole or Bung-hole be on the one side outwards, towards the top. The reason of the goodness of this form of Vessel is, because Cider (as all strong Liquors) after fermentation and working, contracts a cream or skin on the top of them, which in this form of Vessel is as it sinks contracted, and fortified by that contraction, and will draw fresh to the last drop; whereas in our ordinary Vessels, when drawn out about the half or middle, this skin dilates and breaks, and without a quick draught decays and dies.

6. Reserve a Pottle or Gallon of the Liquor to fill up the Vessel to the brim of the Bung-hole, as oft as the fermentation and working lessens the Liquor, till it hath done its work.

7. When it hath compleated its work, and that the Vessel is filled up to the bung-hole, stop it up close with well mix'd clay, and well tempered, with a handful of Bay-salt laid upon the top of the clay, to keep it moist, and renewed as oft as need shall require; for if the clay grows dry it gives vent to the spirits of the Liquor, by which it suffers decay.

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I am against either the *boyling* of *Cider*, or the hanging of a bag of *Spices* in it, or the use of *Ginger* in drinking it; by which things people labour to correct that *windiness* which they fancy to be in it: I think *Cider* not *windy*; those that use to drink it are most free from *windiness*; perhaps the *virtue* of it is such, as that once ripened and mellowed, the drinking of it in such strength combats with that *wind* which lies insensibly latent in the body. The *Cider* made and sold here in *London* in *Bottles* may have that *windiness* with it as *Bottle-beer* hath, because they were never suffered to *ferment*: But those that have remarked the strength and vigour of its *fermentation*, what weighty things it will cast up from the bottom to the top, and with how many bubbles and bladders of *wind* it doth *work*, will believe that it clears it self by that operation of all such injurious *qualities*.

To preserve *Cider* in *Bottles* I recommend unto you my own *Experience*, which is, Not to *bottle* it up before *fermentation*; for that incorporates the *windy quality*, which otherwise would be ejected by that operation: This violent suppression of fermentation makes it *windy* in drinking, (though I confess *brisk* to the *taste*, and *sprightly* cutting to the *Palate* :) But after *fermentation*, the *Cider* resting two, three, or four Months, draw it, and *bottle* it up, and so lay it in a *Repository* of cool *springing water*, two or three foot, or more, deep; this keeps the *spirits*, and the best of the *spirits* of it together: This makes it drink quick and lively; it comes into the *glass* not *pale* or troubled, but bright *yellow*, with a speedy vanishing *mittiness*, (as the *Vintners* call it) which *evaporates* with a *sparkling* and *whizzing* noise; And than this I never tasted either *Wine* or *Cider* that pleased better: Inasmuch that a *Noble man* tasting of a *Bottle* out of the *water* (himself a great *Ciderist*) protested the excellency of it, and made with much greater charges, at his own dwelling, a *water Repository* for his *Cider*, with good success.

An ACCOUNT of
Perry and Cider

Out of GLOUCESTER-SHIRE,

Imparted by

DANIEL COLLWALL Esq;

A Bout *Taynton*, Five Miles beyond *Glocester*, is a mixt sort of *land*, partly *Clay*, a *Marle*, and *Crafb*, as they call it there, on all which sorts of *land*, there is much *Fruit* growing, both for the *Table* and for *Cider*: But it is *Pears* it most abounds in, of which the *best* sort, is that they name the *Squash-Pear*, which makes the *best Perry* in those Parts. These *Trees* grow to be very large, and exceeding fruitful, bearing a fair round *Pear*, red on the one side, and yellow on the other, when fully ripe: It oftentimes falls from the *Tree*, which commonly breaks it; but it is of a nature so *harsh*, that the *Hogs* will hardly eat them.

They usually plant the *stocks* first, and when of competent bigness (and tall enough to prevent *Cattel*) graff upon them: 'Tis observed, that where *land* is *Plow'd* and dress'd for *Corn*, the *Trees* thrive much better than in the *Pasture-grounds*, so as divers *Orchards* are yearly *plow'd* and sown with *Corn*, which for the most part, they suffer their *Swine* to eat upon the ground, without cutting; and such *Plantations* seldom or never fail of plentiful *Crops*, especially in the *Rye-land*, or light Grounds.

About *Michaelmas* is made the *best Cider*, and that of such *Fruit* as drops from the *Trees*, being perfectly mature; and if any are gathered sooner, they let them lye in the *house* 8 or 9 days for the better mellowing.

The *best Mills* to grind in, are those of *Stone*, which resembles a *Mill stone* set *edge-ways*, moved round the *Trough* by an *Horse* till the *Fruit* be bruised small enough for the *Press*: This done, then put it up into a *Crib* made with strong *studds*, and *Oken* or *Haisel* twigs about 3 foot high, and 2; wide, which is placed on a *Stone* or *Wooden Cheese-fat*, a foot broader than the *Crib*, fitted to a round *Trough* for the *Liquor* to pass into the *Cistern* which is a large *Vessel*: When the *Crib* is filled with the *foresaid ground Fruit*, they put a *Stone* upon it, but first they fit a *Circle* of fresh *straw* about the *Crib*, to preserve the *Must* (which is the bruised *Fruit*) from straining through the *Crib* when they apply the *Skrews*, which being two in number, and of a good size, turn in a great *beam*, and so are wrung down upon
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Concerning Cider.

the *Crib*, within which they place two wide and thick *Cheefe-fats*, and several *blocks* upon the *Fruit*, to crush it down with the more force, by which means it is wrung so *dry*, as nothing can be had more out of it. A *Crib* will contain at once, as much ground *Fruit*, as will make above an *Hogs-head* of *Cider*, and there may be dispatched six or seven such *Vessels* in one day.

When the *Pressing* is finished, they take out the *Fruit*, and put it into a great *Fat*, pouring several *Payls* of *Water* to it, which being well *impregn'd*, is ground again slightly in the *Mill*, to make an ordinary *Cider* for the *servants*; this they usually drink all the *Tear* about.

When the best *Liquor* is tun'd up, they commonly leave the *Bung-hole* open, for nine or ten days, to *ferment* and *purifie*; for though in most places they adde *straining* to all this, yet some of the *Husks* and *Ordure* will remain in it. The *Vessel* after a day or two standing, is fill'd up, and still as the *Cider* waxes in working, they supplie it again, till no more *filth* rises; and then *stop* it up very accurately close, leaving only a small *breathing* hole to give it air for a *Moneth* after, and to prevent the *bursting* of the *Vessel*.

Note, That they sometimes put $\frac{1}{2}$ *Pears*, and $\frac{1}{3}$ of *Apples*.

The usual Names of Gloucester-shire Cider-Fruit.

Red breaks, growing chiefly in the *Rye-Lands*, sweet *White-Musts*, *Red-Must*, the *Winter-Must*, the *Streak-Must*, the *Gennes-Moyl*, the *Woodcock-Apple*, the *Bromsgrove-Crab*, the *Great-white-Crab*, the *Heming*, and divers other sorts, but these are the principal.

The *Pears* for *Perry* are,

The *Red Squash-pear* esteem'd the best, the *John-pear*, the *Harpary Green-pear*, the *Drake-pear*, the *Green Squash-pear*, the *Mary-pear*, the *Lullam-pear*: these are the chief.

Another

Another Account of CIDER from a Person of
great Experience.

Cider-Apples for strength, and a long lasting *Drink*, is best made of the *Fox-Whelp* of the *Forest of Deane*, but which comes not to be drunk till *two or three years* old.

2. *Bromsborrow-Crab* the second year; In the Coast and Tract 'twixt *Hereford* and *Ledbury*.

3. *Under-leaf*, best at *two years*, a very plentiful bearer hath a *Rhenish-wine* flavour; the very best of all *Ciders* of this kind, boarded a little within doors. The longer you would keep, the longer you must board your *Fruit*.

4. The *Red-strake* of *Kings-Capel*, and those parts, is in great variety: Some make *Cider* that is not of continuance, yet pleasant and good; others, that lasts long, inclining towards the *Bromsborrow-Crab* rather than a *Red-strake*.

5. A long pale *Apple*, called the *Coleing*, about *Ludlow*, an extraordinary bearer.

6. The *Arier-Apple*, a constant bearer, making a strong and lasting *Cider*; some call them *Richards*, some *Grang-apples*; and indeed they make so excellent a *Drink*, that they are worthy to be recommended into use.

7. The *Olive*, well known about *Ludlow*, may, I conceive be accounted of the *Winter-Cider Apples*, of which 'tis the constant report, that an *Hogs-head* of the *Fruit* will yield an *Hogs-head* of *Cider*.

The *Summer-Ciders* are,

1. The *Gennet-Moyl* of one year: The best *Baking-Apple* that grows, and keeps long baked; but not so unbaked without growing mealy: it dries well in the *Oven*, and with little trouble. The *Gennet-Moyl Cider*, when the *Fruit* is well boarded and mellow, will body, and keep better.

2. The *Summer Red-strake*, of a wonderful fragrant and Aromatic quality.

3. Sir *Ed. Harley's little Apple*, esteemed to make one of the richest *Ciders* in the World. Also, his,

4. *Great Summer-Apple*, resembling the *Red-strake*, juicy and Aromatic.

5. The *White-Must*, streaked *Must*, &c. great bearers, and their *Cider* early ripe.

6. *Pearmains*, have made excellent *Cider*, as good, if not superior to any other in some years; and though it be true, that every sort of *Fruit* makes better *Drink* some years than others; yet, for the most part, the goodness and perfection of *Cider* results from the lucky, or intelligent *Gathering*, or *Hoarding* of the *Fruit*, or from both; and this knowledge must be from *Experience*.

7. Generally, the *Cider* longest in *fining*, is strongest and best lasting, especially if the *fruit* have been well boarded for some time.

8. *Cider* made of *Green*, and immature *Fruit*, will not *fine* kindly, and when it does, it abides not long good, but suddenly becomes
eagre.

K

9. *Cider*

Booth's Key

Concerning Cider.

9. *Cider* kept in very cool *Cellars*, if made of ripe *Fruit*, renders it long in *fining*, and sometimes *Cider* by exposing abroad in the *Sun*, and kept *Warm*, hath sooner *matur'd*, and continu'd long good : But the best *Drink* is that which *finer* of it self, preserved in an indifferent temper.

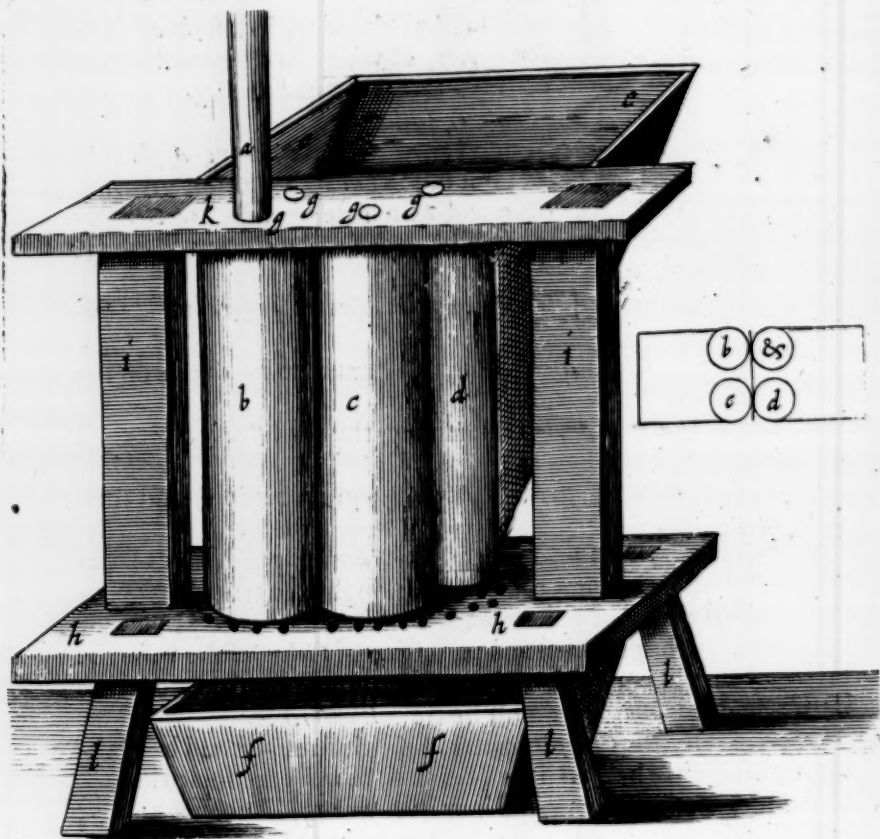
10. All *Cider* suffers *Fermentation* when *Trees* are *blossoming*, though it be never so old ; and *Cider* of very ripe *Fruit*, if *Bottl'd* in that *season*, will acquire a *fragrancy* of the *Blossom*.

11. New *Cider*, and all *diluted* and *watred Ciders*, are great *Enemies* to the *Teeth*, and cause violent *pains* in them, and *Rheums* in the *Head*.

12. One *Rotten-Apple*, of the *same kind* with the *sound*, corrupts a whole *Vessel*, and makes it *Musty*. But,

To Conclude this Treatise,

We will gratifie the *Cider-Master* with the *Construction* of a new kind of *Press* brought into the *R. Society*, by their *Curator*, the ingenious *Mr. Hooke*, and, if perfectly understood by him that shall imitate it, recommended not only for its extraordinary *Dispatch*, but for many other *vertues* of it, chiefly, the accurately *grinding* of the *Pulp*, and keeping the *Husks* from descending with the *Liquor*.



Explication

Concerning Cider.

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Explication of the Figures.

- a* The *Axis*, by which *four Cylinders* are to be mov'd, either by the force of *Men, Horses, Wind, or Water, &c.*
- b. c. d* Three of the 4 (visible) *Cylinders*, so placed, that those which are first to *bruise the Apples*, may stand at about *half an Inch*, or less *distance* from each other: Those that are to press out the *juice* may join as *close*, as they can well be made to move.
- f. f* The *Trough*, in which to receive the *Liquor*, running through certain *holes* made in the lower *Plate* there marked.
- e. e* The *Hopper*, made *tapering* towards the *bottom*, in which you sling the *Apples*, and supply them as they *sink* towards the *Cylinders*. Note, That such another *Hopper* is suppos'd to be also made, and fitted to this *fore-part* of the *Press*, but here omitted, that the *prospect* and *description* of the *Cylinders* may the better be laid open and *demonstrated*.
- g. g. g* The *Spindles* of each *Cylinder*.
- h. h. i. i. k. k* The *Frame*, consisting of two *Plates*, and two *Pilasters*, which hold the *Cylinders* together. Note, That the *Cylinders* must be made of excellent *Oaken Timber*, or other *hard Wood*; the *dimensions* about 3 foot long, one foot and half *diameter*: The rest of the *Frame* for *thickness*, &c. of *size* and *strength* proportionable:
- L L* The *Legs* which support the *Frame*.

FIG. II.

Represents the *Ichnography* of the *First*.

FINIS.
